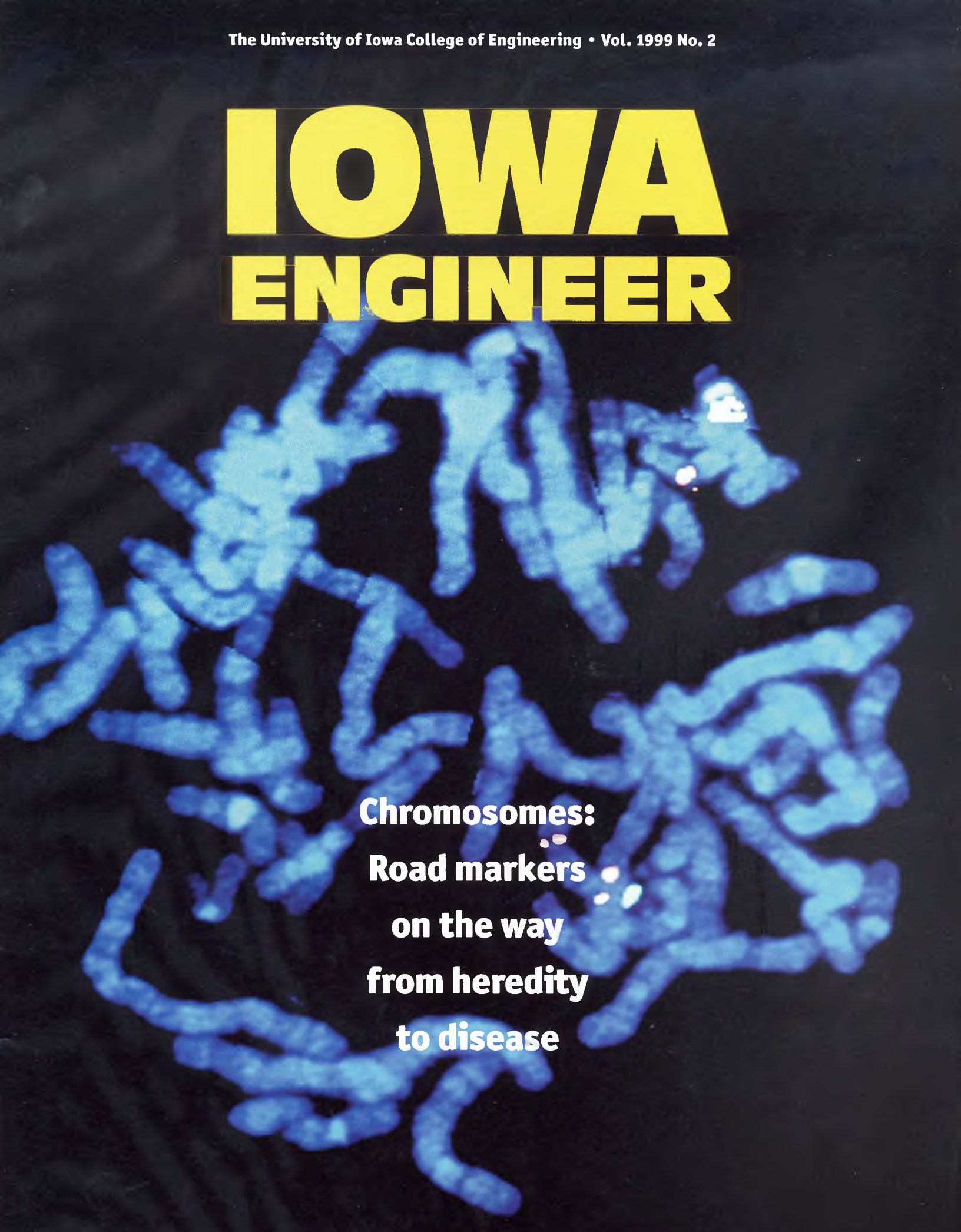


IOWA ENGINEER



**Chromosomes:
Road markers
on the way
from heredity
to disease**

FROM THE INTERIM DEAN



What a busy, adventurous year this has been for the College of Engineering! As interim dean of this forward-looking institution, I am thrilled with the progress our students, faculty, and staff have made during a time of monumental change.

Early this year Richard K. Miller, then our dean, accepted an extraordinary challenge ideally suited to his talent for leadership and his skill at creating a vision for engineering education. As president of the new Franklin W. Olin College of Engineering, in Needham, Mass., Miller is pioneering an entirely new academic environment for undergraduate engineering students.

The legacy of Miller's six-year deanship at Iowa's College of Engineering is remarkable. With Miller at the helm, the College began its \$30-million facility upgrade designed to prepare Iowa engineering students as leaders in technology. And capitalizing on certain academic strengths of The University of Iowa, Miller cultivated close ties with the health sciences colleges as well as with the Colleges of Business, Law, and Liberal Arts—connections that give our students a wealth of broad educational opportunities and that facilitate our faculty members' interdisciplinary pursuits.

For this and more, we owe Dean Miller a great deal. We thank him deeply for the difference he made at Iowa.

Now our facilities upgrade is moving toward completion. Construction and renovation on the Seamans Center for the Engineering Arts and Sciences continues at a feverish pace. We will begin moving into some classrooms in the new addition as early as December, and we will celebrate the completion of the new construction next fall. We will keep you updated as we plan the festivities, so you can join us in Iowa City to mark this momentous event.

At Miller's departure, the college and the University entrusted me with several initiatives. Since then I've worked with dedicated faculty and staff members and students to move the college ahead in significant areas.

Curriculum advancement: We have embarked on a major new effort to give engineering students an education that reaches beyond technology (see story on page 14). Curriculum-wide core concepts recommended by our faculty will be coupled with the latest educational technology to provide enhanced educational experiences in entrepreneurship, the health sciences, technical communication, international issues, and research.

Strategic plan: We have begun long-range planning that will provide the college with a well-defined road map for its future. Our goals and strategies are driven by a vision that is simple, yet focused on giving our faculty and staff the clear direction they'll need to maintain the college's distinctive educational style and its standard of excellence in research. Our strategic plan will be finalized before the end of the year, and we'll share its highlights with you in a future issue of *Iowa Engineer*.

Priorities: We have established a framework to help us make our goals and dreams come true—one that will guide us in achieving multifaceted goals that focus on attracting more top-ranked faculty members and high-achieving students and on developing initiatives of national distinction. Our priorities are:

- Retain "star" faculty members and recruit new distinguished faculty in targeted academic areas;
- Recruit top undergraduate and graduate scholars, and support programs of distinction with scholarships;
- Raise our endowment to support existing programs and continuing innovation in engineering education, and to support the development of innovative programs such as our nationally renowned certificate in technological entrepreneurship, a technical writers resource center, undergraduate research opportunities, internationalization of our curriculum, and collaborative programs with corporate partners to provide our students with enhanced design experiences.

That's an ambitious agenda, but it is a challenge for which the college is well poised. As you read the inspiring stories in this issue of *Iowa Engineer*—about alumnus Dick Stanley's achievements as an engineer and his leadership in world peace initiatives, professor Tom Casavant's revolution in genome research, and graduate Luther Smith's trailblazing aviation exploits—we hope you will be both convinced and proud that the College of Engineering is on the right track toward moving engineering education to new heights. And with such supportive alumni and friends, the college can look forward to a very bright new millennium.

P. Barry Butler

Interim dean, College of Engineering

IOWA ENGINEER

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Cover: Human chromosomes decide our heredity—eye and hair color, height, bone structure. They also determine our susceptibility to certain diseases. The bright spots on these chromosomes show an abnormality associated with autism. (Photo by Helen Spielbauer)



Dick Stanley stands inside the Stanley Foundation's large, inflatable globe, which the foundation uses in presenting educational programs in schools throughout Iowa and other midwestern states. Viewing the planet from the inside provides students with a new perspective on relationships among geographical features and among countries and regions.

DESIGNER AND POLICY maker, GRAD REACHES WORLDWIDE

Richard H. Stanley has built more bridges than most people cross in a lifetime. Under his leadership, the Stanley Group of companies has provided engineering, environmental, and construction services for projects in every state and some 85 countries. Stanley engineers have designed electric systems, industrial facilities, water and wastewater systems, transportation projects, power plants, and, yes, bridges.

But since coming to work at the firm 45 years ago, Dick Stanley also has worked on another kind of bridge: one giving passage from the Cold War climate of fear and distrust to a new era of secure peace with freedom and justice.

It may seem like a reach to go from the applied science of engineering to political and social policymaking. But Stanley has no problem spanning the gap.

"I believe engineering is like many other disciplines," he says from his simple office in the company's Muscatine, Iowa, headquarters. "It can be used for good or for ill. For me, the ultimate question in any endeavor should be, 'Will it enhance and support a better world?' For the answer to be 'yes,' that effort must benefit people not only technologically but also socially."

The foundation of Stanley's philosophy was laid at home. Following World War II, his parents, Elizabeth and C. Maxwell Stanley (BSGE '26, MS '30), were early supporters of the World

Federalist Association (formerly the United World Federalists) and worked to help strengthen the fledgling United Nations.

Dinner table conversation at the Stanley house ranged from world politics to engineering and business.

Max Stanley arrived in Muscatine in 1932 after earning his engineering degree at The University of Iowa. The same year, his second son, Richard, was born. Max joined the Central States Engineering Company, which was renamed Young and Stanley, Inc. When the senior partner retired in 1939, the firm became Stanley Engineering.

Dick Stanley snagged his first job as a Saturday morning office boy for the firm when he was in junior high.

"For 20 cents an hour, I'd haul mail and run off blueprints," he recalls.

After completing his undergraduate degree at Iowa State University, Stanley came home to join the firm as a design engineer. In the early 1960s he decided to earn a master's degree at The University of Iowa while continuing to work full-time. He took courses through the Saturday & Evening Class Program, an experience that made him a fan of distance learning.

Stanley says no one pressured him to become an engineer or join Stanley Engineering—it just was the best application of his talents and interests.

And what was it like to be the boss's son?

"Well, my dad had led my Boy Scout troop," Stanley says with a chuckle, "and I always had to know a little bit more and do things a little better than anyone else for him to certify me for a badge. But his expectations of everyone were high. Once I joined the company, I never felt that being the boss's son was a particular advantage or a disadvantage."

Shortly after joining the firm in 1955, Stanley took on his first significant role as design engineer for the Earl F. Wisdom Power Station near Spencer, Iowa. The young professional raised some eyebrows when he recommended installing vertical circulating water pumps instead of more traditional horizontal equipment.

"They agreed," Stanley recalls, "but they told me they would put my name on the door of one of the lockers, and if the pump didn't work, I had to come back, put on some overalls, and help make everything right."

The vertical pumps worked well throughout the life of the plant, helping provide electricity to customers throughout northwest Iowa.

That innovative and successful design was just one of thousands that have kept clients loyal—more than 90 percent of the firm's business comes from repeat customers—and earned the Muscatine-based firm a reputation as one of the best in America. Since 1956, the company has won world renown, with Stanley designs for electric power plants in Liberia, rural electrification in the Philippines, and a large dam in Oman—to name only a few.

Such projects have a direct and dramatic impact on daily life, Stanley says.

"In a developed country, the work we do improves life incrementally," he says. "But in developing countries, it's like day and night. We have brought pure water and electric power to places that had none."

This effort to bridge the technological distance between the "haves" and the "have nots" is mirrored in Stanley's other prominent role: chair and president of the Stanley Foundation. Max and Elizabeth Stanley created the nonprofit organization in 1956—the same year that Stanley Engineering took on its first international project.

For more than 40 years, the Stanley Foundation has brought together government leaders, heads of nongovernmental organizations, policy specialists, and scholars to confront major global issues. Participants attend these roundtable meetings not as representatives of their governments or agencies but as individuals who can speak freely and effect change.

At the first conferences in the 1960s, participants explored strategies to help the United States and the U.S.S.R. move away from nuclear standoff.

"But good news," Stanley says, "the Cold War is behind us, and we no longer live in constant fear that someone will push the wrong button and destroy us all."

The focus of Stanley Foundation conferences reflects this shift in world affairs. In 1990, for instance, the foundation gathered together some two dozen influential policy makers from around the world to talk about the U.N.'s role during the next decade. At the conference,

the American and Chinese ambassadors to the U.N. met for the first time and began to forge a working relationship.

A few weeks later Iraq invaded Kuwait, and the U.N. Security Council debated how the international community should respond to the invasion.

Stanley says, "The fact that the American and Chinese ambassadors had already developed a relationship outside of the pressures of immediate events helped achieve those Security Council discussions."

The United States, he notes, cannot police the world. So it should take a new role instead, leading the international community as it grapples with global issues, including trouble spots that have bubbled up since the end of the Cold War.

Stanley lauds The University of Iowa's focus on international relations and world affairs.

"It's making a real contribution," he says. "Iowa's international programs are broadening the educational horizons so that Iowa students will be better able to live and work in this new global world."

Stanley has put his enthusiasm for the University into action. He served on the College of Engineering's Building Campaign Steering Committee, and he and his wife raised \$500,000 for construction of the college's new 160-seat lecture hall. They also support Hancher Auditorium's performing arts programs.

him with its Distinguished Award of Merit. And in April, The University of Iowa Alumni Association awarded him its Distinguished Alumni Achievement Award. Stanley and his father are the only two members of one family to have been so recognized.

Ultimately, Dick Stanley describes issues he is passionate about using familiar metaphors.

"Like engineering," he says, "world affairs and international relations deal with infrastructures—but in this case, they are the frameworks that support civilization."

"In a post-Cold War world, market enterprises and a net-

"Like engineering, world affairs and international relations deal with infrastructures—but in this case, they are the frameworks that support civilization."

In addition to chairing the group of companies named for his father, Dick Stanley also serves as vice chair of the board of HON Industries, Inc., a Fortune 1000 office equipment manufacturing company co-founded by his father. In his hometown, he is a familiar figure in community health care initiatives.

Stanley also enjoys a good game of tennis. Twice a week he can be found on local courts, trying to perfect his backhand.

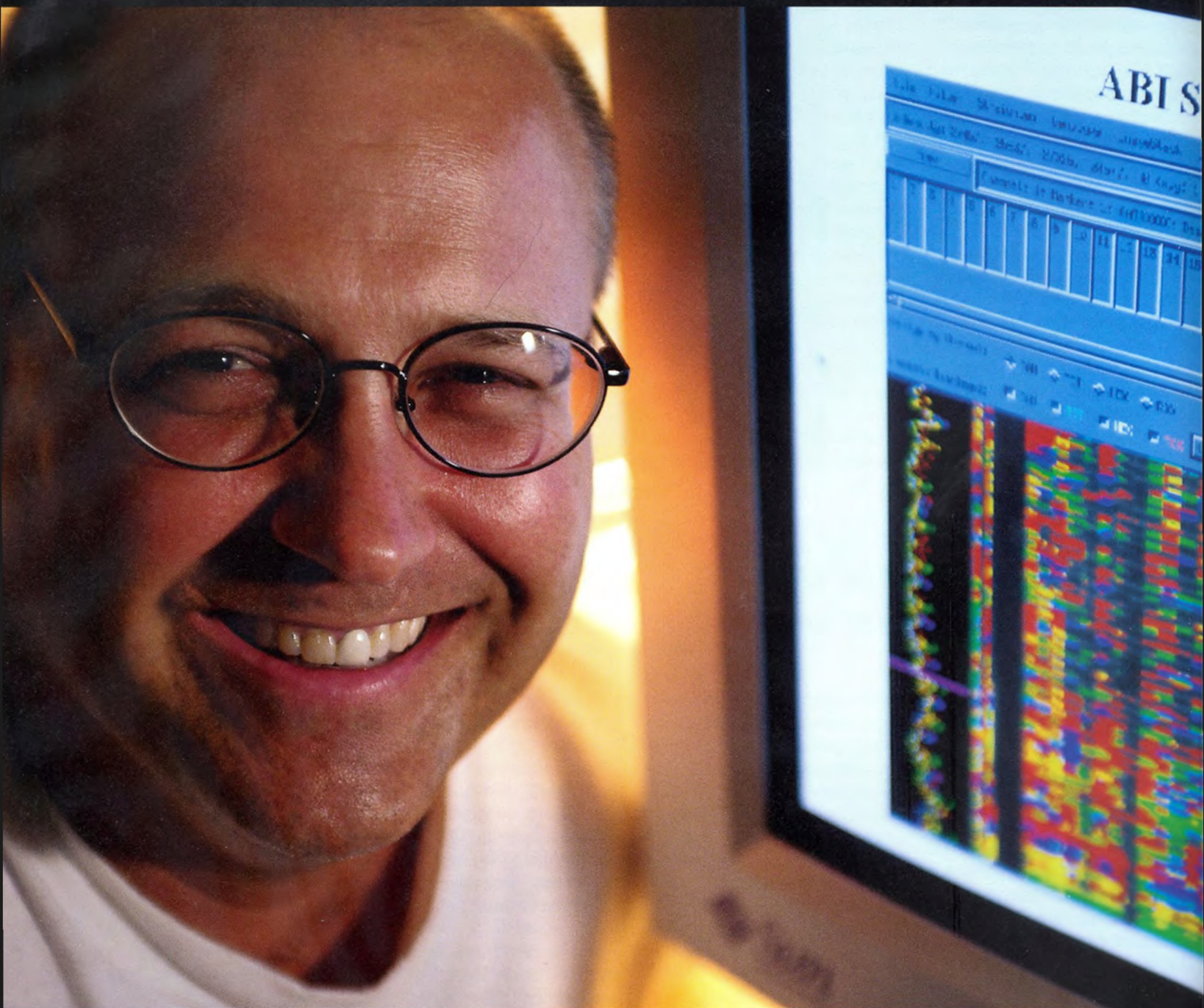
"I tried golf," he says with a laugh, "long enough to share Mark Twain's opinion that golf is a good walk spoiled."

Last November, The American Consulting Engineers Council recognized Stanley's outstanding engineering and community service career by presenting

worked society challenge the old hierarchical governments," he continues. "This shift to decentralization and empowerment also is reshaping corporations. More and more, employees are getting involved in shaping their companies' visions, objectives, and operations."

"The burden is on all of us to work for the greater good rather than for narrow self-interest, to take the long view rather than seek instant gratification, to be inclusive and welcome diversity, to be flexible and not daunted by change. We live in a world where much is possible if we are wise enough to collaborate."

—Jean C. Florman



Tom Casavant, professor of electrical and computer engineering, is breaking the bonds of data overload with his computer system GenoMap, which helps researchers identify genes and map them on chromosomes. Casavant collaborates with UI physicians and geneticists on the work, which is aimed at locating the genes involved in diseases such as macular degeneration, hypertension, and autism.

Partners plot a vast frontier

Scientist's team exceeds the speed of numbers to answer a gene mapping challenge

When Tom Casavant considers the broad span of his research, he is quick to point out that persistence pays.

The University of Iowa professor of electrical and computer engineering has developed some of the world's most effective software for managing and analyzing complex data. An applied scientist, Casavant devoted his first 12 years as an engineer to high-performance computer system design. But then he extended his reach, becoming a "late-blooming" medical and genetics expert.

Since then, he has captured funding of more than \$17 million for collaborative work that is breaking disciplinary boundaries and illuminating the causes and transmission of disease.

It all started six years ago with a phone call from a UI ophthalmology professor whom Casavant describes as "charmingly persistent."

"It was late on Friday," Casavant recalls, "and I

really didn't want to talk. But this eye doctor just wouldn't take no for an answer."

Edwin Stone asked if Casavant could develop software to help discover the genetic causes of macular degeneration. The two men agreed to meet the next week, and a session scheduled for one hour soon stretched into two, then three, then four. That day the engineer and the physician forged what was to become an extraordinarily successful interdisciplinary partnership.

That collaboration has been funded in part by the Carver Family Trust, which awarded \$375,000 to Casavant, Stone, and UI professor of pediatrics Val Sheffield to begin developing computer systems that could analyze inheritance patterns in families that experience certain genetic diseases.

Because these diseases are rare, however, it is relatively easy to trace them through family pedigrees, even without high-

powered computer data crunching.

"So," Casavant says, "we ended up not doing what we had planned, but something even better."

As he worked with Stone and other physicians, Casavant became interested in the intellectual tools physicians use in diagnosing disease.

"Basically," he says, "doctors use algorithms. They don't think of it that way, of course. When you ask physicians how they come to diagnostic conclusions, they often say 'through intuition.'"

But Casavant was convinced that physicians apply a systematic procedure that correlates genetic data, family history of disease, and patient observation with a final diagnosis. These problem-solving procedures—or "algorithms"—serve as unconsciously developed recipes for arriving at the right conclusions.

Applying their understanding of artificial intelligence and the capabilities of complex computer

processing, Casavant and his students began to unravel the problem-solving procedures that clinicians apply consciously and unconsciously every day. Then they "reconstructed" these algorithms into a World Wide Web-based program that now helps lab technicians, geneticists, statisticians, and physicians systematically track down the genetic causes of disease.

The Iowa engineer calls his diagnostic database system "GenoMap."

"GenoMap helps researchers and clinicians associate certain genetic diseases to specific locations on human chromosomes," Casavant says.

In the course of his collaboration with medical school faculty, Casavant has become something of an expert in the molecular chemistry and biochemistry of human genetics. The genetic "blueprint" for humans is contained in 23 pairs of chromosomes that carry DNA molecules, which

(continued on page 8)

are basic units of inheritance. Certain stretches of DNA along a chromosome make up genes—functional units that control the inheritance and expression of one or more traits, such as gender, eye color, and genetic disease. Each gene is an ordered sequence of paired units known as base pairs. The particular order of these base pairs is a kind of molecular fingerprint that identifies the gene.

During the last decade, researchers around the world have been working to associate specific genes with particular chromosomes, locate those genes at precise “addresses” along the length of the chromosomes, and then identify—or sequence—the base pairs that make up each gene.

Applying the tools of molecular biology, researchers can identify specific genetic sequences along particular chromosomes by staining them. The resulting banding pattern is unique to each genetic sequence.

In addition to mapping and sequencing genes, researchers also are linking specific genes to particular traits and diseases. Eventually, a catalog of the total human genetic material, also known as the human genome, will be available.

But the scale of the human genome project is staggering.

“We estimate that there are at least three billion base pairs to be sequenced in the human

genome,” Casavant says. “Since current technology can only sequence about 500 base pairs of a clinical sample at a time, it’s like trying to put together a six-million-piece puzzle. It’s very difficult to match each piece of DNA under investigation to the portions of the human genome that have already been mapped, sequenced, and linked to a specific trait.”

The problem is complicated by the molecular and biochemical structure of DNA. Many sequences differ only slightly, although the traits they control may differ greatly. In addition, traits and diseases can be controlled by more than one gene. Further, experts estimate that only 1-3 percent of human DNA actually is expressed in some physical manner. The rest of the human genome may change through time, remaining unexpressed until environmental stress activates the genetic material, which then can provide the organism with an evolutionary advantage.

GenoMap, a collection of Java-based Internet programs, allows users around the world to identify clinical and research samples of DNA by comparing them to the current “catalog” of the known human genome.

“It can tell researchers to what degree of probability a particular sequence of DNA is linked to a particular physical trait,” Casavant says.



“Even 10 years ago, the cost, size, and speed of computer memory would never have allowed such investigations. But in the final years of the 20th century, technology is finally enabling us to break apart huge genetic research puzzles and sort massive amounts of data into manageable units.”

Casavant situates his work between the intellectual arenas of management science and computational science. His computer tools can link medical experts around the world, enhancing physicians’ access to information and broadening their diagnostic considerations. Access to the rich human genetics database is especially useful for tackling diseases that have many different causes or symptoms.

In the past, for instance, autism has proven to be particularly elusive in its diagnosis and treatment. Autistic individuals cannot connect with reality,

and they recoil from social and physical contact.

Experts have suspected genetic causes. Researchers at Harvard University, Vanderbilt University, and The University of Iowa examined more than 400 regions on the human genome to locate the causes of autism. They then constructed a kind of genetic template. Now clinicians around the world can use GenoMap to match their patients’ genetic material to this diagnostic template.

“The lab technicians still have to purify and amplify the DNA of study subjects,” Casavant says, “but once they have images of a patient’s genetic material, our system can compare those images with the standard genetic map of various kinds of autism.”

In addition to being accurate and accessible, GenoMap diagnosis is extremely efficient. Technicians “eyeballing” data may need several months

to compare banded patterns on chromosomes. The computer can achieve the same result in a matter of minutes.

Terry Braun, a doctoral candidate who works in Casavant’s lab, conducts the GenoMap computer analysis. Braun, who earned his bachelor’s and master’s degrees in electrical engineering at Iowa, is one of a vanguard of Casavant’s engineering students who are pursuing interdisciplinary graduate degrees.

“Interdisciplinary education is one of the emphases in our current curriculum review,” says Casavant, who was awarded a UI Collegiate Teaching Award last spring. “We encourage our students to be more than just electrical engineers, to also become adept in genetics, law, business, or some other field, and to understand the broad applications and implications of what they are learning.”

Casavant says he himself has become a student who bridges disciplines.

“From the beginning, I knew I would have to learn a great deal about genetics and medical science before we started to design the computer systems. I was fortunate—Stone and Sheffield had faith that collaboration was vital, and the College of Engineering allowed me to invest the time to learn what I needed. Now we’re applying the GenoMap system to the study of diseases such as hyper-

tension and obesity."

Casavant's learning curve was steep. After earning his Ph.D. from Iowa in 1986, the Sioux City native focused his efforts on the design and application of software for high-performance and parallel computing, which can be used for complex data analysis such as weather prediction and military operations. In his early work, Casavant explored military applications of high-performance parallel computing systems.

"As long as there was a Cold War," he says, "we had plenty of work and were well-funded. But a lot of military funding was dedicated to a rather irrational effort to make sure America had the world's fastest computers. With the fall of the Soviet Union, those projects largely evaporated."

Casavant notes that starting in the mid-1980s, the National Science Foundation called on scientists to define certain "grand challenge problems" that would help refocus research from how to wage war to how we might understand and live better in the world. That interdisciplinary discussion led to several proposed projects, including human genome studies. The scope of such massive medical research would have been unthinkable in the days when money was spent on military efforts.

When budget-cutting incentives appeared,

Casavant decided to view the demise of military research as an opportunity. He devoted his sabbatical year to retooling his skills, and he began to study computation science and the application of high-performance systems to the biological and medical sciences. Then a few months after Casavant arrived back home, Ed Stone cold-called the department to ask for help with his macular degeneration research.

Since Casavant began developing his computer tools to manage massive amounts of genetic data, he has widened his own collaborative net to include researchers in preventive medicine, psychiatry, and pediatrics. With Veronica Vieland, a statistical geneticist and professor of preventive medicine, Casavant is developing a computer system that can accommodate vast, anonymously registered clinical input from genetic databases around the world. Casavant notes that Iowa researchers' ability to analyze such extraordinary amounts of data and efficiently map genomes is unequalled.

In 1997 a \$4.7-million grant from the National Institutes of Health allowed Casavant, Sheffield, and associate professor of pediatrics Bento Soares to begin cataloging the rat genome. Rats and mice often are used in genetic research because it's easy to get tissue samples from them and their mammalian genome

closely resembles the human genome.

Researchers at other institutions attempting to build similar databases have managed to discover about five new genes per 100 "looks" at genetic sequences. Using their new system, however, University of Iowa researchers have succeeded in delineating 34 novel genetic sequences for every 100 "looks."

At the outset, Casavant thought the project would be a success if it discovered 24,000 novel gene sequences over two years—more than double what any other institution has been able to accomplish. But he and his students reached that goal before

the end of the project's first year.

"It's a wonderful opportunity for an electrical engineer to be able to apply the power of computer technology to real-world problems," Casavant says. "It's especially interesting for me to see the parallels between computer languages and genetic languages."

The University of Iowa researcher, who holds two patents for computer hardware designs, has no doubt about the impact of computers on genetic research.

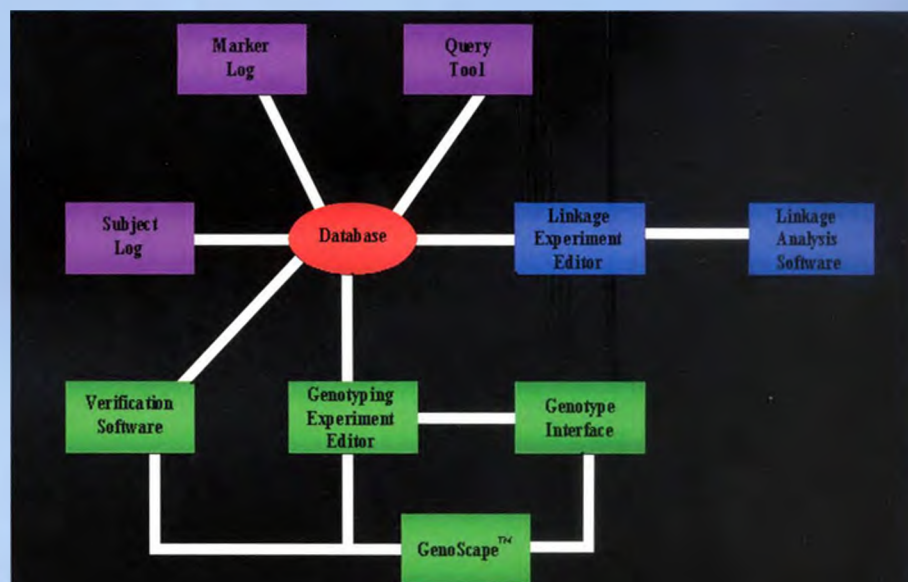
"In the 19th century," he says, "doctors had barely accepted the genetic basis for disease. We consider the practice

of medicine back then so primitive as to be almost unscientific. But as the application of computers to genetics becomes increasingly sophisticated, people of the 21st century just might think the same of 20th-century medicine."

He adds that the key word is "discovery." As we unlock more and more of the secrets of genetics, diagnosis won't come after disease has developed, but before it appears. Doctors will be able to treat diseases before people even realize that they have them.

"And that," the engineer adds, "will be a miracle."

—Jean C. Florman



GenoMap's user interface opens the door to a vast array of genetic research data and tools, presented in manageable formats. For instance, a researcher might choose the "Verification Software" link to look for errors or inconsistencies in experimental results. A geneticist could access the "Linkage Experimental Editor" for help in forming a hypothesis about links between diseases and regions of the genome. Check out the GenoMap web site: <http://molsun.ophth.uiowa.edu/~genomap/>



From the Director of Development

Kevin Collins

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It's an honor to pen my inaugural column to all of you. I began work as the College of Engineering's director of development last December, returning to my home town of Iowa City after spending 10 years in St. Paul, Minn., most recently as senior development officer for the University of St. Thomas. It is good to be back. I enjoyed the chance to work, ever so briefly, with Dean Richard K. Miller before his departure in January to found the Franklin W. Olin College of Engineering, and I am grateful for the legacy of his vision and leadership.

More important, I am grateful to the faculty, students, staff, and alumni who have made the college the fine institution it is today. I am impressed by the faculty's commitment to teaching and the collegiality and remarkable research projects that abound at the college. Alumni have stepped up in dramatic fashion to support the overwhelmingly successful building campaign. The Seamans Center for the Engineering Arts and Sciences will help attract top-drawer students and faculty members while serving as a welcoming center for the college's many alumni and friends. I marvel at how \$11 million was raised in just over two years for this long overdue project, a feat that speaks to your commitment to the college.

The building campaign generated a high level of interest and momentum among alumni. I have already visited with a number of you who have expressed a deep and abiding interest in the college's future. Your connections with the college have helped position it for even greater success.

Many of those connections spring from the student/faculty relationships that develop over the educational process—and that often transform lives. The story of the Frederic G. Higbee Memorial Scholarship is a powerful illustration of how such relationships can influence the college careers of individual students (see story on page 13). What began as a tribute by former students to a revered engineering drawing professor has grown into an endowment that now helps support several engineering students each year.

It is an honor to join the ranks of a college whose faculty, students, staff, and alumni have fostered such a tradition of stewardship. Naturally, I am excited about my new position and look forward to working with you in advancing the college even more. I will be calling many of you to get acquainted, and please don't hesitate to call me at The University of Iowa Foundation to introduce yourself; phone 800-648-6973 or 319-335-3305. Or send an e-mail to the address above.



Engineering sweeps field at annual awards dinner

It was the College of Engineering's evening in April as The University of Iowa celebrated its 82nd annual Finkbine Dinner. An engineering alumna, a faculty member, and four engineering students received six of fifteen Hancher-Finkbine Medallions awarded University-wide at the ceremony.

Lilia A. Abron (PhD '72) received the Hancher-Finkbine Alumni Medallion. Abron, who is founder and CEO of PEER Consultants, P.C., a Washington, D.C.-based environmental consulting firm (see *Iowa Engineer*, fall/winter 1997), was the first African-American woman in the nation and the third woman at the University to receive a doctorate in chemical engineering.

Sharif Rahman, assistant professor of mechanical engineering, won the James N. Murray Faculty Award, which recognizes an untenured faculty member who has outstanding rapport with students and who creates an exemplary classroom atmosphere. It is named in honor of the late James N. Murray, UI professor and past chair of political science.

Amanda Ennis, a mechanical engineering senior from Columbia, S.C., won one of the two Hancher-Finkbine Undergraduate Student Medallions presented for 1999, and Annette Churee Dietz, a doctoral student in civil and environmental engineering from Ames, Iowa, received one of the two Hancher-Finkbine Graduate/Professional Student Medallions.

James Connelly, a biomedical engineering senior from Dubuque, Iowa, and Kyle J. Munn, a graduate student in engineering and genetics from Downers Grove, Ill., received two of the four Distinguished Student Leader Certificates presented.

The Finkbine Dinner, held since 1917 to honor campus leaders, is named after William O. Finkbine, a Des Moines, Iowa, businessman and 1880 UI College of Law graduate.

The tradition of awarding Hancher-Finkbine Medallions was begun in 1964 to recognize outstanding leadership, learning, and loyalty among students, faculty, and alumni. The medallions are named for Finkbine and for Virgil M. Hancher, UI president from 1940 to 1964.

Departments' leadership changes hands

K.B. Chandran is the new head of the Department of Biomedical Engineering. Chandran, whose appointment started late last year, joined the UI faculty in 1978. He is a specialist in biomechanics, hemodynamics, medical physiology, and fluid dynamics with current research interests in vascular prostheses and cardiac imaging. He was awarded the college's Distinguished Faculty Service Award in 1995.

Chandran holds undergraduate degrees from American College, at Madras University, and the Indian Institute of Technology. He earned M.S. and D.Sc. degrees from Washington University.

The College of Engineering also has three new interim department heads: Greg Carmichael is leading the Department of Chemical and Biochemical Engineering, Rob Ettema is interim head of the Department of Civil and Environmental Engineering, and Ted Smith is acting as executive officer for the Department of Mechanical Engineering. All three are full professors and longtime faculty members of the college: Carmichael since 1978, Ettema since 1980, and Smith since 1971.



K.B. Chandran

Two answer the call to serve as interim and associate deans



P. Barry Butler

When Dean Richard K. Miller departed the University late last January to become president of the Franklin W. Olin engineering college in Massachusetts, Iowa's College of Engineering spent no time leaderless. As February dawned, P. Barry Butler began work as interim dean, and the college opened its search for a permanent successor to Miller.

Butler, a professor of mechanical engineering, served as the college's associate dean for academic programs from September 1997 until he became interim dean. His appointment has strong support, according to University of Iowa provost Jon Whitmore.

"Butler has been serving in a major administrative position within the College of Engineering," Whitmore said. "He has been directly involved with recruiting and appointing faculty,



Forrest Holly

handling student affairs issues, and working on curriculum changes.

"I consulted widely with faculty and administrative leaders in the college and found very strong support for this appointment."

A nationally recognized expert in thermal science and energetic materials, Butler has published extensively in the field. He holds bachelor's, master's, and doctoral degrees from the University of Illinois at Urbana-Champaign.

As the college continues its search, Forrest Holly, professor of civil and environmental engineering, is serving as interim associate dean for academic programs. Until he accepted that appointment, Holly was head of his department.

In addition to addressing academic matters at the college, Holly provides oversight for the Student Development Center and the Iowa Computer-Aided Engineering Network.

New awards set to honor unique alumni spirit

Service and entrepreneurial spirit: Both are vital to the engineering profession—so much so that the College of Engineering has created two new awards for alumni who exemplify them. Last November at a special recognition dinner for the college's honor clubs, then-dean Richard K. Miller announced and presented the new awards. The College of Engineering Dean's Award for Distinguished Alumni Spirit of Entrepreneurship went to Gary F. Seamans (BSEE '71). Darrell D. Wyrick (BSChE '56, MS '57) received the Dean's Award for Distinguished Alumni Service to the college.

Seamans, retired CEO of Westell Technologies, Inc., of Aurora, Ill., was recognized for his "exceptional achievement and leadership in creating and inspiring the principles of innovative entrepreneurial spirit—setting an extraordinary example for aspiring students, dedicated faculty and staff, and fellow alumni."

Wyrick, who recently retired as president of The University of Iowa Foundation, was cited for his "long-term exceptional commitment and self-sacrifice in advancing the principles and goals" of the college, setting an extraordinary example for aspiring students, dedicated faculty and staff, and fellow alumni.

In bestowing the awards, Miller remarked that while the college on many occasions had recognized outstanding alumni, there had been a void in recognizing exceptional entrepreneurship and extraordinary alumni service.

"These new awards are meant to finally give deserved recognition for these two very important areas," Miller said.



Students use lab to take design international

The various components of a Boeing 777 are produced all over the world before being brought together to be assembled into one airplane. To carry off this multisite manufacturing act, Boeing must have engineers who can work together as a team, even when an ocean divides them.

As Boeing and other American companies rely increasingly on international collaboration in the design, manufacture, and marketing of their products, the engineering profession is becoming more global, too, says P. Barry Butler, interim dean of the College of Engineering. Butler hopes a new program

called Virtual International Design (VID) will help engineering students prepare for a workplace that spans the globe.

VID, which focuses on helping students develop the skills they'll need to work effectively on international teams, is one option seniors can choose for their required capstone design class. Just as the Program for Enhanced Design Experience puts Iowa students to work on area industry projects (see *Iowa Engineer*, fall/winter 1997), VID teams them with their counterparts at the Université de Provence, in France, to work on a project for industry.

This past spring, the team's charge was to work with HON Industries, of Muscatine, Iowa, to analyze varied designs for a personal thermal comfort control system in an office cubicle. The system would allow an office worker to vary the temperature in his or her cubicle. The Iowa students shared insights with their French colleagues via video- and teleconferences held in the Seamans Center's Enhanced Design Lab, and they downloaded technical data and graphics onto a shared web site to keep each other up-to-speed on the progress of the project.

May engineering graduate Amanda Ennis was one of three UI students—two in mechanical engineering and one in the business college—who worked on the project. Ennis, who signed on after graduation as a hardware design engineer for IBM in Rochester, Minn., says the design class piqued her interest in international work.

"I never realized how easy it is to communicate on a technical level," she says. "Engineering itself is its own language. Because we use the same scientific principles, we can communicate even if we don't speak the same language."

Besides discovering the ease of transatlantic communication, the project's goals included helping students get comfortable using electronic communication equipment and understand the shortcomings of such communication, Butler says.

"We want to develop the students' abilities to work in a team, especially when some of their team members are in another country," he says. "I think early on there is a tendency for students to think they can do something better or faster if they sit down and do it them-

selves, but that's not going to happen all the time."

Thanks to funding from HON and the ALCOA Foundation, the UI team was able to travel to France over spring break to meet and work face-to-face with their French colleagues.

Emad Tanbour (Ph.D. '98), senior project manager at HON, embraces the project and says he would have participated in VID had it been offered when he was a student.

"It's a wonderful program—a unique opportunity for students," Tanbour says, noting that programs such as VID also help HON stay current with design innovations and product demand. "These programs are a tool for industry to cope with market changes. Global design breakthroughs can be detected through them."

One of the assignments HON gave the students when they went abroad was to look at different office space designs.

"The economy is going global, and we need to be aware of what is going on overseas. It's important to learn what can satisfy the international customer," Tanbour says, adding that VID also helps industry identify future job candidates.

Future plans for VID include increasing the number of projects and international collaborations for students to choose from; Butler already has been in contact with interested colleagues in Korea. There are also plans to expand the program's space by outfitting an interactive classroom separate from the Enhanced Design Lab, with help from an Aluminum Company of America grant.

—Sara Epstein

With vision, strategy, and a bit of help, graduating senior sets out on his way

Although he is the first engineer in his family, Mike Fiddelke had to look no further than his entrepreneur parents for career inspiration. After a childhood spent watching his parents build and manage a number of small-town motels across the Midwest, Fiddelke was inspired to augment his major in industrial engineering with a minor in business administration.

"I knew a long time ago that I wanted to start my own business," the Manchester, Iowa, native says. "When I started looking around at colleges, I realized that Iowa could provide avenues toward that end. My years here have allowed me to build a solid technical and entrepreneurial foundation. When opportunity strikes, I'll grab it."

Fiddelke says an industrial engineering internship proved to be one of his most valuable educational experiences. During the 1997 fall semester, he worked at Centro Corporation, headquartered in North Liberty, Iowa. Centro supplies hollow plastic parts, like fuel tanks, to agricultural equipment manufacturers such as Deere & Company and Caterpillar.

Fiddelke felt right at home in the family-owned business.

"They paired me with a plant engineer who had 20 projects on the table," he says. "We collaborated on several projects, and they gave me six or seven of my own. They really threw me into the deep end, but that's one reason it was so valuable. I got hands-on experience and real responsibility."

One of Fiddelke's responsibilities was the implementation of a new molding machine, a project he says entailed alterations in company work plans as well as the retraining of workers.

"I got the full range of experience," he says. "I had to justify my ideas and recommendations to upper management and get the guys on the floor excited about the new equipment. I also worked hard to get their input and pass it along."

Fiddelke lauds the strong applied component of his educational experience at Iowa.

"Professor [of industrial engineering] Gary Fisher really focused on manufacturing," Fiddelke says, "and gave his students a lot of practical skills that we can apply. His door was always open, whether you wanted to talk about a particular lecture, engineering in general, or future job prospects."

"I knew a long time ago that I wanted to start my own business. When I started looking around at colleges, I realized that Iowa could provide avenues toward that end."

Fiddelke's own job prospects are excellent. After graduation he joined the consulting division of Minneapolis' Deloitte & Touche. As a systems analyst, he helps implement software for companies in various industries, including manufacturing and banking.

Negotiating the labyrinth of a new job will probably seem easy after three years negotiating the shifting pathways through the engineering building's deconstruction and its rebirth as the Seamans Center.

"It's been interesting," Fiddelke says with a laugh. "But I'm here to take classes, and it really wasn't much of a hardship to walk halfway across campus and sit in a dark, decrepit chem lab to do it. I'm proud of my education, and some day soon I'll be a proud alumnus."

If asked, Fiddelke will advise younger students to do as he did—take your classes seriously, but also get the most out of the broader educational experience that the University offers. Besides playing serious intramural basketball, the young engineer still finds time to join friends for a night on the town.

Fiddelke's scholastic efforts and broad outlook earned him several scholarships, including one of five funded during academic 1998-99 by the Frederic G. Higbee Memorial Fund, which was established to honor the man who served as the head of Iowa's engineering drawing department from 1905 to 1952.

Higbee was a much-loved teacher who trained two generations of engineers. When he died in 1968, his former students set up the scholarship, which has been funded from interest earned on the original \$100,000 principal.

"It's meant a lot to me," Fiddelke says of the scholarship. "Other semesters I've had to work as many as 30 hours a week plus take a full engineering load. Because of my scholarship support, I've been able to focus more attention on my classes."

Fiddelke says that even though he never knew Higbee, the late professor has made a difference in his life.

"It's important for students to know that scholarships are available," he says. "Besides the obvious benefits of financial assistance, scholarships also let students know that Iowa alumni and friends have confidence in the students of today."


—Jean C. Florman

"It's meant a lot to me.... Because of my scholarship support, I've been able to focus more attention on my classes."



Time for a Change

Planners shape curriculum fit for a new century



For many colleges, raising \$11 million in record time and constructing a high-tech but user-friendly facility would be laurels enough to rest on. But for students and faculty members at The University of Iowa College of Engineering, a state-of-the-art physical plant is just part of a larger package whose core is an engineering curriculum designed for the 21st century.

In early 1997 Richard K. Miller, then dean of the college, sounded the call to curriculum reform that would look beyond the modernized facilities to engineering education of the future. Since then, alumni have joined with faculty members and students in exploring how to revamp Iowa's curriculum.

BUT IOWA'S PROGRAM ALREADY IS STRONG. WHY CHANGE IT?

Barry Butler, professor of mechanical engineering and interim dean, notes that during the last decade, new fields such as biomedical and computer engineering have opened novel opportunities for students and alumni. And whether future engineers practice their craft in academic or industrial, domestic or international settings, the skills of negotiation, communication, and marketing will serve them well.

As a member of the college's Curriculum Advancement Task Force, Butler helped draft a vision statement that will help shape the new academic program. He says the statement calls for the revamped curriculum to reinforce several "core concepts," including teamwork, communication skills, open-ended problem-solving abilities, computer graphics skills, expertise in multiple disciplines, and an awareness of the ethical, social, and global implications of engineering sciences.

While several top engineering colleges nationwide also are updating their curriculums, Iowa hopes to seize the lead by capitalizing on its unique attributes, including a long-standing tradition of engineering core courses, collaboration with Iowa's world-class College of Medicine, and strong ties to an outstanding College of Liberal Arts.

V.C. Patel, professor of mechanical engineering, chaired the Curriculum Advancement Task Force, which drafted the initial vision statement for the new engineering course design. Made up of engineering faculty and administrators, the task force examined educational guidelines suggested by the National Science Foundation and the National Academy of Engineering as well as various curriculum revisions under consideration at other leading engineering schools.

"We took into account the important characteristics of our particular college," Patel says, "including its relative small size and personalized educational experience. We were very aware of how successfully a revamped curriculum and the new building with its superb learning spaces could work together to magnify each of those benefits."

The task force solicited responses to their suggestions about the curriculum from students, faculty members, the Engineering Advisory Board, and a number of alumni and corporate friends. The final draft of the vision statement, "Educating the Individual: Engineering Education at The University of Iowa," addressed critical issues posed by these reviewers.

"Throughout the process," Patel says, "we maintained our focus on the value of individualized education. That means the curriculum must provide for career goals that may change during the student's time at Iowa as well as after he or she enters the workforce," he continues, adding that **THE COLLEGE'S GOAL IS TO EQUIP ENGINEERING STUDENTS FOR A LIFETIME OF SUCCESS IN AN EVOLVING MARKETPLACE.**

"This college has always had a good curriculum and strong faculty," Butler says. "So when the administration started talking about curriculum reform, there were a lot of questions."

Patel adds that some faculty members and alumni asked, "What's broken that you need to fix?"

Patel's response: not a thing.

"Obviously, we've trained our students well over the years," he says. "All you need to do is look at the success of Iowa's

CORE CONCEPTS

Practice in teamwork

Communication skills

Open-ended problem-solving abilities

Computer graphics skills

Knowledge in multiple disciplines

Awareness of the ethical, social, and global implications of engineering sciences

engineering alumni. But the last time we overhauled the curriculum was 30 years ago, when Hunter Rouse was dean. Today we are moving into a dynamic, global market that will demand broader applications for engineering and an array of nontechnical skills in the marketplace."

And no one knows that better than engineers in the private sector. When invited to comment on the proposed curriculum changes, Joseph Adamski notes that "the ability to appropriately discuss and negotiate how to solve a problem with engineering and management associates is sometimes as important as solving the problem itself."

Adamski, who is vice president of engineering at Dacore Appliances in Pasadena, Calif., and a member of the Engineering Advisory Board, adds that "in today's working environment, multidisciplinary teams composed of engineers and nonengineers support each other in delivering all aspects of a project and in sharing the prize."

Because the curriculum task force carefully considered such comments when drawing up its vision statement, the final version received overwhelming support from the engineering faculty. The college then organized a Core Curriculum Com-

mittee to design a curriculum for all engineering students in their first three semesters. In this phase of the curriculum revision, Patel says, professor of civil and environmental engineering Wilfrid Nixon "led the charge."

The committee drafted a report that offers guidelines for the three-semester core courses. Engineering faculty members are considering the report and soon will decide whether to accept it.

THE CORE CURRICULUM IS DESIGNED TO INCLUDE THE KNOWLEDGE THAT ALL ENGINEERS NEED. Mathematics, basic sciences, engineering sciences and methodology, engineering design, and communication skills will provide the pillars of the early undergraduate curriculum.

Engineering Development Council member James Ashton (BSCE '64), agrees that "a strong base of fundamentals is critical." He likens the undergraduate education at some top engineering schools to "drinking out of a fire hose: A lot of water goes by, but you don't get much to drink."

Butler agrees.

"Students fresh out of high school often don't have a clue what type of engineering they want to pursue," he adds. "By offering a common core of courses in all departments, students will be able to switch departments fairly easily within their first year and a half of study."

And for those who are certain what area of engineering they want to pursue, the curriculum will offer opportunities to broaden the scope of study.

"A student might be designing a bridge in one project and an artificial heart valve in another," Butler says.

THE CURRICULUM ALSO WILL ENCOURAGE STUDENTS TO DEVELOP A SECONDARY FOCUS, which could be a specialization in one field of engineering or in the liberal arts, business, or other nontechnical fields. In a recent letter to the dean, Wayne Fethke (BSIE '71) suggested a first-year curriculum that includes managerial accounting, cost accounting, and psychology or sociology.

"It may sound bizarre," says Fethke, president and CEO of Fiskars, Inc., "but an anthropology course I took has helped me

vastly throughout my career. Industrial engineers deal with people, and that course helped me to be sensitive to various ways people behave and interrelate."

Along with encouraging input from alumni and friends in the industrial sector, the college sought student comments, too. Early on, Miller invited members of the Engineering Student Council to his house for pizza and talk.

"He gave them a summary of what we're trying to do and why," Butler says, "and then he asked them, 'What would you do if you had the opportunity to choose a secondary focus?'"

The answers ran the gamut from technical course work to the fine arts, and students' enthusiasm for the revised curriculum concept was unanimous.

In the past, the college has allowed interested students to pursue nonengineering passions such as dance, Russian, and marketing. In fact, the two-year-old technical entrepreneurship certificate program recognizes the importance of a broad engineering education.

But **THE REVAMPED CURRICULUM WILL EXPLICITLY ENCOURAGE NONENGINEERING EXPERIENCE FOR ALL ENGINEERING STUDENTS** and still enable them to complete their degrees within four years.

After the faculty has approved the core curriculum, each department will outline the specific requirements for students' remaining two-and-a-half years. There will be a transition period, but the new curriculum should be in place for students who enter in fall 2000—shortly before completion of the building modernization.

The new approach to engineering education should underscore the school's commitment to providing a nationally recognized educational experience in a world-class facility.

"The new curriculum will not simply duplicate what other schools offer," Butler says, "but tap the talents and facilities that are uniquely Iowa's."

—Jean C. Florman

Four join college team as teachers, researchers



Zhi Ding

Associate professor, electrical and computer engineering

B.Eng. ('82) in radio engineering, Nanjing Institute of Technology (China)

M.A.Sc. ('87) in electrical engineering, University of Toronto (Canada)

Ph.D. ('90) in electrical engineering, Cornell University

Professional experience

Visiting faculty research fellow, Australian National University and NASA Lewis Research Center; faculty research associate, U.S. Air Force Wright Laboratory; visiting associate professor, Hong Kong University of Science and Technology; associate professor, Auburn University; technical consultant for Nortel Corp. and Analog Device, Inc.

Research interests

Wireless digital communications, signal processing, system identification, signal detection, parameter estimation

In collaboration with the telecommunications industry, my group is focusing on the study and development of more reliable and efficient communication systems. We will make the University a key player in future information technologies.

The University of Iowa has a longstanding tradition of academic excellence. I enjoy being part of that through my work with faculty members and students here, and I look forward to interdisciplinary collaborations with colleagues across the campus.



Anthony E. English

Assistant professor, biomedical engineering

B.A.Sc. ('86) in engineering physics and electronics, Simon Fraser University (Canada)

M.A.Sc. ('89) in electrical and biomedical engineering, University of Toronto (Canada)

Ph.D. ('96), Harvard University/MIT Division of Health Sciences and Technology

Professional experience

Instructor and teaching assistant, MIT; postdoctoral fellow, MIT

Research interests

Tissue engineering, cartilage and cardiovascular tissue substitutes, biomaterials applications

My field of tissue engineering depends heavily on interdisciplinary collaborations with researchers from the medical sciences. When considering coming to Iowa, I was most impressed by the enthusiasm and willingness of faculty in other colleges to help me get started. They offered to share their expertise, equipment, and laboratories. I'm particularly looking forward to close collaborations with Alan Moy, of internal medicine, and Victor Rodgers, of chemical and biochemical engineering.

The strengths of the College of Engineering coupled with those of the University's nationally acclaimed health sciences colleges and UI Hospitals and Clinics make an ideal environment for advancing tissue engineering. The University of Iowa is well-poised to make medical history in this important area.



Richard A. Hardin

Researcher and adjunct assistant professor, mechanical engineering

B.S. ('86), M.S. ('88), and Ph.D. ('94) in mechanical engineering, University of Kansas

Professional experience

Researcher at Universität Stuttgart (West Germany); researcher and instructor at UI Department of Mechanical Engineering Solidification Laboratory

Research interests

Heat transfer and solidification

I'm working in the Solidification Laboratory, where I am fortunate to have first-rate facilities and great colleagues. I also have the opportunity to be involved in both fundamental research and the transfer of this research to industry.

At present, I'm working with students and research staff to develop and apply computer models based on heat transfer and solidification physics to metals processing. By working with industrial sponsors in the continuous steel casting and steel foundry industries, we are demonstrating to our industrial collaborators that they can enjoy significant cost savings and product quality benefits through application of our research.

A unique aspect of this position, compared to working in industry, is the opportunity to teach undergraduate and graduate students through these projects. That's something I truly enjoy.



Daniel Ross Thedens

Assistant professor, electrical and computer engineering

B.S. ('89) in biomedical engineering, M.S. ('93) in electrical engineering, The University of Iowa

Ph.D. ('99) in electrical engineering, Stanford University

Professional experience

Research assistant in electrical engineering, engineer in internal medicine, The University of Iowa; research assistant, Stanford University

Research interests

Medical imaging

I'm very excited to be back at The University of Iowa. The outstanding people and resources of the electrical and computer engineering department and the College of Engineering made the decision to return to Iowa an easy one. I am also proud to be part of a faculty with such a clear commitment to teaching.

My research is in magnetic resonance imaging (MRI) of the heart and coronary arteries. MRI provides a noninvasive method of looking at important measures of cardiovascular health. This research requires knowledge from both engineering and medicine, so the collaborative atmosphere at the University is ideal for this kind of work.

An ounce of prevention...

Nearly 15 years have passed since a toxic release from the Union Carbide pesticide plant in Bhopal, India, wreaked havoc on the city, killing thousands and debilitating hundreds of thousands.

The accident, often referred to as the world's worst industrial disaster, motivated industries and governments to set new safety standards.

Today, the College of Engineering, too, is doing its part to ensure the safe handling of chemicals. Its chemical engineering department is the first in the nation to establish a process safety course with an accompanying laboratory.

For the past several years, juniors in chemical engineering have been required to take David Murhammer's chemical process safety course. Last year, a base grant from the National Science Foundation, combined with funds from Monsanto, Cargill, 3M, and Praxair, helped establish the laboratory portion of the class.

"The purpose of the lab is to give students hands-on experience," says Murhammer, associate professor of chemical and biochemical engineering. "The industry people I know are very excited about it. It's in their best interest to have students well-trained before they enter the workplace."

In the labs—there are four per semester—students simulate accidents and study potentially hazardous aspects of chemicals, such as flammability limits, flashpoints, electrostatic buildup, and runaway reactions. Lectures feature toxicology, case studies, accident investigation, and government regulations. Guest speakers from Monsanto, Cargill, and 3M present industry perspectives.

When Jamisue Mooers, a senior from Davenport, was an intern summer 1998 in Monsanto's environmental division, she relied heavily on the material she learned in Chemical Process Safety.

"It's the most important class you'll ever take if you're going into industry," says Mooers, now a teaching assistant for the course. "It's essential to know what precautions to take."

Mooers and another teaching assistant, Brian Dorathy, prepare the lab experiments and help students with the exercises, which are performed using a test apparatus hooked up to a computer. One experiment, for example, simulates a vessel rupture in a chemical plant, much like

**...is tons
better
than
learning
from
mistakes**

what happened in the Bhopal incident. The students determine the properties of the specified chemical, record the speed and direction of the wind, measure the amount of vapor released, and note the time of day. They then calculate the effect of the accident at specified distances from the plant, which most often is located in or near a town.

"The students might also be asked, for example, 'Two hours from now, how will these people be affected?' Often you don't have all the information you need, so you have to make assumptions and estimates. For safety purposes, you always want to make sure those estimates are conservative—you need to overestimate," Mooers says, to come up with the worst-case scenario.

Although each worker in a chemical plant is required to pass safety courses—like how to operate a fire extinguisher or correctly walk up a ladder—Mooers says this class helps prepare chemical engineering students for the broad spectrum of problems they may encounter.

"Students learn the importance of regulations they might at first have thought tedious," she says.

The class yields some surprises, too, such as the potential dangers posed by electrostatic buildup.

"Just walking across a carpet or removing a sweater can create enough static electricity to ignite a fire under the right conditions," Mooers says. "Most students haven't really thought about that."

By giving students a solid foundation in process safety, the course helps employers' efforts to recruit well-qualified workers, says Karen Kjar, who earned a B.S.E. in ME at Iowa in 1984 and now is a technology manager at 3M.

"An essential objective for engineers involved in the design, engineering, and construction of new process facilities, or in modifications to existing facilities, is to prevent incidents that might cause injury, property damage, and/or environmental pollution," Kjar says. "Programs like the Process Safety Lab directly impact education and learning, and thereby, our ability to recruit educated and well-prepared engineers."

—Sara Epstein



PATRIOT PILOT

ENGINEER

ALUMNUS FOLLOWS INSPIRATION TO FULFILL HIS DREAMS



Smith (right) and his wife, Lois (center), meet President Clinton at the White House 1998 Veterans Day ceremony.

When *Iowa Engineer* recently asked Luther Smith for an interview appointment, he politely declined.

"I'm afraid I'll have to say 'no,'" Smith said, adding, "I'm going to the White House that day."

A veteran World War II aviator, Smith was invited to Washington to represent the United States Army Air Force (which became the U.S. Air Force in 1949) in the Clinton administration's Veterans Day celebration. The invitation was the latest in a long series of honors for the University of Iowa alumnus, who earned his bachelor's degree in mechanical engineering in 1950.

As a young boy growing up in Des Moines, Iowa, Smith longed to fly the planes he saw landing at the municipal airport. By the time he was a teenager, he was regularly walking and hitchhiking to the airport to "hang around" and help the mechanics as they serviced and refueled aircraft.

"The pilots and mechanics at the Des Moines airport took a liking to this 13-year-old kid who was so interested in airplanes," Smith recalls. "I just became part of the airport community."

Six years earlier, Charles Lindbergh had flown across the Atlantic. He was young, handsome, and daring. Smith says that for him and millions of others, Lucky Lindy epitomized everything wonderful about being an American.

In the mid-1930s, another turn of events made a lasting impression on Smith. Airline companies had been franchised to conduct a new service—air mail—but they didn't get much money for it.

"So the pilots went on strike, and the government turned to military pilots to keep the mail running," Smith remembers, adding that in the days before advanced navigation systems, flying was risky business, and many military pilots had little experience flying at night or in bad weather.

"But they were my heroes," he says. "A pilot would touch down in his open-cockpit plane, jump out, get his aircraft refueled, grab a cup of coffee, and be



on his way. They might be afraid of the weather, but they carried the mail no matter what.

"It didn't take long for me to decide I wanted to be a military pilot."

Another of Smith's role models led a decidedly more earthbound life. Des Moines native Archie Alexander was the first African-American to earn an engineering degree from The University of Iowa (B.E. 1912, C.E. 1925). Although Alexander was already practicing his craft when Smith was still a young boy, the famed bridge-builder and highway designer served as a mentor and hero to Smith as well as many other young black students.

As Smith approached graduation from Roosevelt High School, he realized that "it was foolish for a black American to say he wanted to be a military aviator, because there were none." So instead he set his sights on college, where he could learn a profession. Smith hoped that, armed with a mechanical engineering degree, he might eventually break into the ranks of the country's military pilots.

When Smith began his studies in 1938, Iowa City and the University were segregated, and like all black students at the time, he was not allowed to live in college residence halls. Instead, he stayed in the home of one of the town's black families.

Smith says that although he was one of only a few African-American engineering students at the University, his early student experience in Iowa City was no better or worse than one might have expected in segregated pre-war America. Two years into his studies, however, his life took a dramatic turn.

In the late '30s and early '40s, the United States military started to hear rumblings in the federal courts about excluding blacks," Smith says. "Military leaders were concerned that if military aviation was forced to integrate, black airmen would be put into previously all-white units. To forestall this, the Army Air Force started all-black units, which after World War II came to be known as the Tuskegee Airmen."

Smith decided to go for his dream and become an Army Air Force pilot. He quit school and trained at the Tuskegee Army Air Field in Alabama. In 1944 he began combat duty in Europe as a fighter pilot in the 12th and 15th Air Forces with the all-black 332nd Fighter Group.

"Between July 1944 and May 1945," Smith says, "the Tuskegee Airmen flew 200 bomber escort missions over nine European countries without the loss of a single bomber to enemy aircraft. That's like playing professional football every-other day for a year and never allowing the quarterback to be sacked. No other group of pilots can claim such a record."

Smith's own military record is studded with honors. He won the Distinguished Flying Cross, Air Medal with six Oak Leaf Clusters, Purple Heart, and Mediterranean Theaters Campaign Ribbons.

He also was awarded a Prisoner of War Medal in recognition of the seven months he spent in a Yugoslavian hospital and a German prisoner of war camp. He was captured on a bombing and strafing mission that began on Friday, October 13, 1944.

Smith was part of a special flight of four who were winding down their second tour of duty. When his wingman decided to strafe a row of oil cars, Smith was forced to provide cover for him. Smith strafed the oil cars, but unbeknownst to him, his target was an ammunition cache. He hit the cache while flying about 20 feet off the ground, and although he survived the impact, he was forced to fly through the erupting flames.

"By the time I was over Yugoslavia, my coolant had all leaked out, the aircraft was on fire, and I was forced to bail out," he says.

While trying to get out of his burning P-51 Mustang, Smith got caught halfway. His oxygen mask blew off, and he pulled the ripcord on his parachute while still stuck in the plane.

"Really, that saved my life," he says, "because as the chute opened, it ripped me out of the aircraft. But in the process, my leg got caught and I broke my hip."

He landed, unconscious, in a tree, where German soldiers rescued him. The mission—his 133rd—was to have been his last.

"Instead of going home," Smith says, "I became a POW." Looking back on the episode, Smith shrugs and says, "Well, life's like that sometimes."

A prisoner of war for seven months, Smith was released when the war ended in May 1945. He spent another two years in military hospitals, and as a result of his permanent combat injuries he retired as a captain at the age of 27. Although his career as a military pilot was over, he harbored no bitterness.

"For a while in the hospital and POW camp I got pretty depressed," he recalls. "There you are—you don't know the language, you're far from home, you're injured, and your family thinks you're dead."

"But then one day it hit me—I'd survived. Just getting out of the plane, I could have died at least four times, but I'd been saved. I told myself right then, 'Make your life count.'"

(continued on page 20)



Luther Smith and three of his fellow advanced aviation cadets at Tuskegee Army Air Field in 1943 (clockwise from left): Maurice Esters, of Webster City, Iowa, who died in World War II combat over Yugoslavia; Joseph Gomer, of Iowa Falls, Iowa; Smith; and John Briggs, of St. Louis, Mo. (seated in cockpit)

One of millions of veterans supported by the GI Bill, Smith returned to Iowa City to finish his engineering degree. The country he returned to was different from the one he had left. For one thing, he was allowed to live in University-owned housing. Smith moved into Quadrangle residence hall and served a term as the hall's president.

But not everything had improved.

"When I first came back," Smith says, "Dean [Francis] Dawson called me into his office. 'Smith,' he said, 'I'm aware of your previous work as a student here and your war record. It's a fine record. But do you realize there just aren't any black engineers?'"

Smith says that Dawson periodically expressed his concern about this disparity. Smith's optimistic response was always the same: "Dean, we fought a war for freedom of opportunity."

Smith has many good memories of his second stint at Iowa. He still recalls the friendly smile and sharp mind of the dean's secretary, Mary Sheedy. And during his senior year, Smith's electrical engineering professor asked him to install an electrical power set that had been donated by the General Electric Company. As Smith got the equipment operating and debugged, he wrote a set of procedures that were turned into a teaching curriculum. He also was invited to lecture in the electrical engineering classes about his work.

As Smith's college life wound down, Dawson asked him to keep a diary of his experiences trying to find a job.

"If you can't make it," he told Smith, "I'd like to know." Although Smith tried for months, the well-educated engineer and highly-decorated war veteran was unable to land a job in Chicago, Minneapolis, Detroit, Cleveland, Philadelphia, or St. Louis.

Luther Smith (first row, fourth from left) and 19 of his classmates who, out of a starting class of 100, graduated to second lieutenant in May 1943 at Tuskegee Army Air Field; the airplane in the background is a P-40 Warhawk Fighter.

"The results," he says, "were zero. So I wrote up my experiences and sent them to the dean, who had them published in an issue of the fall 1950 College of Engineering *Transit*."

When tensions with North Korea rose in 1950, Smith began working as an engineering associate at the Rock Island Arsenal. During the conflict, President Harry Truman ordered full integration of the military and equal employment opportunities in the defense industry.

Finally, in 1951 Smith was invited to join the General Electric Company in Schenectady, New York.

"When they asked me what department I'd like to work in," Smith says, "I told them aerospace engineering in flight control systems. When the head of the division heard I was a World War II pilot, he did everything he could to get me in."

Smith worked as an aerospace engineer at GE until he retired in 1988. During that 37-year tenure, he transferred to the company's Missile and Space Operation in Philadelphia, was awarded two patents, published numerous technical papers, worked on special assignments for the Air Force, NASA, and the United States Navy Submarine Command, and earned a master's degree in engineering from Pennsylvania State University (1977).

Smith has maintained his energetic pace since retiring from GE. He is a division chair in the Society of Automotive Engineers Aerospace International and vice chair of Radnor Township School Authority. He and his wife, Lois, have two grown children.

In 1995, Smith represented the U.S. Army Air Corps as one of seven World War II veterans in the European celebration of V-E Day. He has worked tirelessly to gain recognition for the contributions of the Tuskegee Airmen and has served on the engineer architect evaluation board that chose the design for the World War II Memorial to be built on the Mall in Washington, D.C. Groundbreaking is scheduled for Veterans Day 2000.

Smith occasionally returns to his home state, most recently volunteering to talk about his war experiences with mostly white, at-risk high school students in Dubuque.

"Iowa is such an important part of my life," he says. "I began my education there and finished it there. And there were such changes during that time. When I began, it was segregated. But I was lucky to be able to go back after it had changed and really become part of campus life. The college gave me an incomparable opportunity for leadership and learning."

—Jean C. Florman



CLASS NOTES

Readers who would like to correspond with alumni mentioned in Class Notes can get address information from the University's alumni office. Contact Alumni Records, The University of Iowa, 400 Levitt Center for University Advancement, Iowa City, IA 52242-1797; phone 319-335-3297. E-mail: alumni-records@uiowa.edu

1940s

Jay W. Miller (MS '43) writes that he has retired three times from Boeing. He now lives in a retirement residence in Seattle, Wash., where he is active in his church and community. He has three children, seven grandchildren, and three great-grandchildren.

Edward Schneckloth (BSME '43) is enjoying retirement in Sherman Oaks, Calif., where he is busy writing his third novel. The Schneckloths travel and have taken 28 vacations in foreign countries.

Norman I. Stein (BSME '43) retired in 1988 from the Naval Sea Systems Command, Department of the Navy. A registered professional engineer, Stein also has worked with the Atomic Energy Commission. He lives in Potomac, Md.

Joseph B. Summers (BSCE '48) received the first Merriam Improved Irrigation Award, presented in March by the U.S. Committee on Irrigation and Drainage. Summers was honored for his service to USCID and to the International Commission on Irrigation and Drainage, and for his endowment of the USCID/Summers Engineering Scholarship Fund. Summers is president of Summers Engineering, Inc., of Hanford, Calif.

L. Willard Peterson (BSCE '49) retired in 1988 from Black & Veatch Consulting Engineers, of Kansas City, Mo., where he had worked since 1949. Peterson, who lives in Overland Park, Kans., has been a board member and now is president

of Parvin Estates, a not-for-profit housing development of 308 low-income homes. He also sits on the B&G executive committee for Johnson County Community College. In his spare time, Peterson indulges in a game of golf.

1950s

Donald E. Bently (BSEE '49, MS '50) received the American Society of Mechanical Engineers' 1999 R. Tom Sawyer Award at the society's International Gas Turbine Institute technical congress in June. Bently is founder, owner, CEO, and chair of the board at Bently Nevada Corp. and serves as president of Bently Rotor Dynamics Research Corp. Bently also owns Bently Agridynamics and Bently Biodynamics, is general partner of the Bently Family Limited Partnership, and is owner and president of Gibson Tool & Supply Co.

Carl F. Reeder (BSChE '50) retired in 1998 from ADM Corn Processing, of Decatur, Ill., where he was director of technical services. Now he lives in Cedar Rapids, where he consults for ADM and chairs the Renewable Fuels Association technical committee.

Julio Sanjines-Goytia (BSCE '50) heads the Autonomous Authority of the Lake Titicaca Basin, and area of 140,000 square kilometers between Bolivia and Peru. Sanjines-Goytia also graduated from the U.S. Military Academy in 1945. After earning his engineering degree at Iowa, he joined the Bolivian Army and founded the Corps of Engineers in Bolivia. He has served his country as an ambassador to the United States, Canada, and Peru, was a United Nations representative in Ecuador, represented the InterAmerican Development Bank in Central America, and was president of the Andean Regional Bank in Venezuela. He has two children and four grandchildren. Sanjines-Goytia and his wife, Rosario, live in Avenida, Ecuador, and have enjoyed traveling throughout Latin America.

Dick Emmert (BSChE '51) has received the Antwerpen Award for Professional Service from the American Institute of Chemical Engineers. (A feature story on Emmert appeared in the last *Iowa Engineer*.)

Dwayne L. Mozey (BSME '54) retired in 1986 from Sandia National Laboratories, Albuquerque, N.M., where he was a project leader in the transportation safeguards division. Since then, the Mozeyes have kept busy building a summer home in the mountains of northern New Mexico, where Mozey also is treasurer of the property owners' association and president of the incorporated water association. The Mozeyes also go ballroom dancing at least twice a week.

Lyle F. Minkler (BSME '55) is retired and lives in Prescott, Ariz., where he was chair of mathematics and science at Yavapai College.

Lou Anderson (BSME '59) writes that he worked for 23 years as a project engineer and consultant on environmental test equipment and automation and process equipment, then changed careers in 1983 to work in ornamental iron. He lives in Vista, Calif., where he owns R.K. Iron Works. "My engineering background serves me well to this day," Anderson says.

1960s

Ramon K. Henderson (BSCE '60) spent time in the air force and then worked in civil engineering before becoming a pilot for American Airlines. He retired from the airline in 1997. Henderson lives in Cary, N.C.

Harold E. Smith (BSCE '60) was honored by the Des Moines [Iowa] Regional Wastewater Reclamation Authority Management Agency in December, when the group dedicated the new Harold E. Smith Water Quality Laboratory, in Des Moines.

Roger J. Byrne (BSCE '58, MS '61) is manager of sales and marketing for the ABC Water Pollution Control Corp. of Mequon, Wis. Byrne lives in Brown Deer.

Richard H. Stanley (MS '63) received a 1999 Distinguished Alumni Award for Achievement in June from The University of Iowa Alumni Association (see story on pages 4-5). Stanley also received the 1998 Distinguished Award of Merit from the American Consulting Engineers Council.

Dennis Zmolek (BSME '63) lives in Marshalltown, Iowa, having retired as director of manufacturing engineering after 35 years at Fisher Controls International. Zmolek writes that his last few years with Fisher were most challenging. As the company expanded to manufacturing sites worldwide, Zmolek traveled extensively, making friends in Asia and Europe.

Wayne E. Kruse (BSCE '65) retired last summer after 33 years with the Los Angeles Department of Water and Power. Kruse and his wife, Margaret, who now live in La Canada, Calif., recently toured Fiji, New Zealand, and Australia. Kruse also volunteers with the San Gabriel Valley Habitat for Humanity and serves on an engineering team for La Canada.

Herm Reininga (BSIE '65) was awarded the Defense Manufacturing Excellence Award early this year by the Association for Manufacturing Technology. Reininga, who is vice president of operations at Rockwell Collins, in Cedar Rapids, Iowa, was recognized for his leadership in using commercial manufacturing technology in defense systems and for his involvement in manufacturing for government and industry.

J. Thoreson (BSME '64, MS '65) continues his work at Valuable Information Ltd., analyzing and advising on the competitive edge. His recent publications are sold out, according to his web site.

Wes Vincent (BSEE '65) lives and works in Kokomo, Ind., where he is a product line manager for semiconductors at Delphi Delco Electronics Systems.

Dennis E. Bowman (MS '66) was posthumously named a fellow of the American Society of Mechanical Engineers. Bowman was honored for "significant contributions to both industry and professional societies." He brought state-of-the-art concepts to hydraulic systems and control at Deere and Company and was the second chair of the Fluid Power Systems and Technology Group.

(continued on page 22)

CLASS NOTES

D.C. Reddy (PhD '67) is vice-chancellor-select at Osmania University, in Hyderabad, India. The position is similar to that of president at an American university.

R. William Van Sant (BSME '66, MS '67) received a 1999 Distinguished Alumni Award for Achievement in June from The University of Iowa Alumni Association. (Van Sant was the subject of a feature story in *Iowa Engineer*, spring/summer 1997.)

1970s

Thomas W. Moore (BSChE '68, MS '72) is a registered professional engineer, working as a staff chemical engineer at Western Kentucky Energy Corp., in Henderson, Ky. Moore lives in Newburgh, Ind.

Dean Oskvig (BSCE '72) has been named senior vice president and head of the Power Delivery Division of Black & Veatch, a worldwide infrastructure designer and builder. Oskvig is headquartered in Overland Park, Kans., and lives in Stilwell.

Gary Craig Marchi (BSME '76) recently spent three months in Rhode Island to work on molds for a fully composite transit bus, then transferred to Alabama to finish building the vehicle. Marchi is a design engineer responsible for advanced vehicles for his company, North American Bus Ind., Inc., of Anniston, Ala. He lives in Jacksonville.

Richard J. Pech (BSME '78) works for the Timken Co., of Canton, Ohio, where he is manager of application development, a post he has held since last fall.

Abbass Hassani Seresht (BSIE '78) is an engineer at Robab Co., in Behshahr, Mazandaran, Iran.

1980s

Barbara J. Sines (BSIE '80) is vice president and general manager of the electronic operator interface business at Rockwell Automation, in Milwaukee, Wis. Sines is responsible for marketing, product development, and manufacturing of graphic and text display terminals used in industrial automation.

Sastry Munukutla (PhD '81) received the 1998-99 Caplenor Award from Tennessee Technological University. The award recognized Munukutla's contributions to the power industry, including a technique for balancing coal and air flow in pipes, a method for monitoring a coal-fired unit's performance in real-time, and a new technique for accurate cost analysis.

Greg A. Paul (BSME '83, MS '84) received the 1998 William J. Conroy Standards Professional Award from the U.S. Product Data Association. Paul is an engineer specialist in CAD/CAM engineering at Lockheed Martin Tactical Aircraft Systems, of Fort Worth, Tex. He lives in Keller.

Gloria Borgstahl (BSE in BME '85) is an assistant professor of chemistry at the University of Toledo, where she teaches biochemistry and is studying protein structures relevant to breast cancer. She also is involved in a NASA study of microgravity protein crystal growth. Borgstahl married in 1993, had a daughter in 1995, and a son in 1998.

David Field (BSE in EE '85) is senior business adviser for Chicago Manufacturing Center. Field reports that he took the company public in 1995 and now is a manufacturing consultant. He and his wife, Sherri Jewett (BSN '86), had their fourth child in 1998. They live in Elmhurst.

Vijay Kumar (MS '82, PhD '85) has received the Bell Labs Fellow Award of his pioneering contributions to research and development of high-performance ATM and IP switches.

Rhett Livengood (BSE in ChE '85) has been promoted to software programs manager at Intel Corp., Santa Clara, Calif., where he received Intel's Division Recognition Award for his work launching the Pentium III. Livengood and his wife, Robin, had a baby girl in July 1998. They live in Los Altos.

Sandra M. Pfeiffer Schultz (BSE in IE '86) signed on last November at John Deere Dubuque Works, as a quality engineer in the engineering division, after working for the U.S. Army for 12 years, designing metal pellets and adapters. Schultz writes that she has been married for 12 years and has three children: a son, and boy/girl twins. Her husband, John, farms. Schultz is certified as a quality engineer by the American Society of Quality Engineers. She also is certified as a weld inspector by the American Welding Society.

Tom Seaberg (BSE in ME '86) became president and CEO of his company, Seaberg Industries, of Moline, Ill., in January 1998. He also spearheaded the company's successful registration as ISO 9002-1994 in June of that year.

Douglas S. Smith (BSChE '86) is principal consultant for Valitech, a Los Altos, Calif., engineering consulting firm for biotech/biopharmaceutical companies.

Christopher Sulentic (BSE '83, MS '86) is principal consultant for International Network Services, of Sunnyvale, Calif. He lives in Atlanta, Ga.

Remigio H. Galarraga-Sanchez (MS '87) received a Ph.D. in hydrology and water resources from the University of Arizona in 1995. Now he is a professor of hydraulics at Escuela Politecnica Nacional, in Quito, Ecuador, and coordinates the study of El Niño events and climate change conducted by the French organization Orstom and Ecuador's National Institute of Meteorology and Hydrology. He also is the national correspondent for the world glacier monitoring system, based in Switzerland, and he consults with the oil industry on water resource and risk analysis issues.

Gregory J. Kirsch (BSE in EE '87) is a patent attorney responsible for electrical, software, and telecom patent practice at Needle & Rosenberg,

P.C., of Atlanta, Ga. He also is an adjunct professor of patent law at Emory University's law school and speaks frequently on patent protection for software and communication technology. He presented a paper at the 1998 World Computer Congress and served on a panel at the 1999 International Conference on Software Engineering. Kirsch and his wife, Lanie, have two children.

Alex Orgren (PhD '87) has been named a distinguished member of Lucent Technologies' senior technical staff.

Daniel VanDerWeide (BSE in EE '87) is on the University of Delaware faculty, where he was promoted to associate professor last year. He also directs the school's Center for Nanomachined Surfaces. VanDerWeide received an NSF Career Award and a PECASE award in 1997, and the Office of Naval Research Young Investigator Pro-

gram Award in 1998. He lives in Landenberg, Pa.

Jeffrey Arensdorf (BSE in EE '89) is a founding partner and systems consultant at Logical Solutions, Inc., a Des Moines, Iowa, software consulting company that specializes in client/server and web-based system design. Arensdorf and his wife, Laura, a regional pharmacy manager for John Deere Health Care, welcomed their first child, a son, in January. The Arensdorfs reside in Waukee.

1990s

Jay M. Brady (BSE in CE '89, MS '90) has received the Tudor Medal, Young Civilian Engineer of the Year, from the Society of American Military Engineers. He was recognized at the organization's national conference in Houston. Brady is an engi-

In memoriam

Frank L. Woodward (BE in CE '25), of St. Paul, Minn., December 26, 1991

Ransom G. Amlong (BE in ME '27), December 24, 1977

Harold S. Houser (BE '27), of Lebanon, Pa., November 28, 1991

Joseph A. Hratz (BSEE '30), of Davenport, Iowa., March 1, 1999

John E. Mouglin (BSME '30), of Fairfield, Iowa, November 1976

Ronald S. Blough (BSEE '31), of Fairfield, Iowa, January 11, 1999

Donald D. Jenkins (BSEE '31), of Cedar Rapids, Iowa, December 25, 1998

Ernest Kosek (BS IE '31), of Cedar Rapids, Iowa

Richard N. Lyons (BSE in IE '31), of Longmont, Colo., December 25, 1998

Wilbur H. Carl (BSEE '32), of Dayton, Ohio, January 30, 1998

Everett C. Handorf (BSCE '32), of Memphis, Tenn., March 8, 1999

James I. Martin (BSME '32), of Clinton, Iowa, April 18, 1999

Charles D. Mullinix (BSCE '30, MS '32), of Claremont, Calif., March 11, 1998

Wendell B. Seward (BSEE '32), of Los Angeles, Calif., November 13, 1998

Lawrence E. Travis (BSEE '32), of Blue Eye, Mo., November 18, 1987

John E. Weland (BSEE '32), of Deerfield Beach, Fla., January 1982

Warren C. Davie (BSEE '33), of Visalia, Calif., September 11, 1993

Harry L. Falgen (BSChE '33), of Philadelphia, Pa., October 1978

George A. Marston (MS '33), of Amherst, Mass., March 30, 1999

Laurel F. Merrick (BSME '33), May 1983

neer at Stanley Consultants, of Muscatine, Iowa. He works in the company's environmental and water resource division.

James A. Lauer (BSE in IE '89, Ms '90) is a project engineer for worldwide design of tractor undercarriage at Caterpillar, Inc., in East Peoria, Ill. He completed his M.B.A. at Bradley University in 1996 and obtained registration as a Professional Engineer last December. Lauer and his wife, Ann (MA music '86), have two children, a boy and a girl. They moved to Grenoble, France, in August for a job transfer by Caterpillar.

Kurt Gerveler (BSE in ME '90) and **Lynn Winkleman Gerveler (BSE in ME '91)** relocated to the Phoenix, Ariz., area summer 1998 so that Lynn could take a new position as an R&D engineer with her company, Honeywell. Kurt completed an M.B.A. from DePaul University last year and works as a sales

engineer for Clark Power Products, which serves utility companies throughout the Southwest. The Gervelers have a four-year-old son and live in Cave Creek.

Choong Han Chu (BSE '91) and his family are based temporarily in Switzerland, where Chu is helping manage a Taiwanese power plant project for ABB Power Generation. When not on assignment, Chu lives in Petaling Jaya, Malaysia.

Geoffrey Ward (BSE in ME '91) earned an M.S. and Ph.D. from Purdue University after graduating from Iowa and now is a senior project engineer at Rolls-Royce Allison, in Indianapolis, Ind. He and his wife, Beth, had their first child last November. They live in Lebanon, Ind.

Gloria Jennings Meyers (BSE in ChE '92) is a chemical manufacturing development engi-

neer at Abbott Laboratories, in Chicago. She is married, has a son, and lives in Lake Villa.

Stuart Oberman (BSE in EE '92) earned a Ph.D. in 1997 from Stanford University and now is on the technical staff at AMD, of Sunnyvale, Calif., where he was a co-architect of the 3DNow! technology and a designer of K6 and K7 microprocessors. He also is a consulting assistant professor at Stanford.

Jeanette A. Thielen (BSE in BME '92) has moved to Seattle to take a job as director of biomedical engineering at the Veterans Affairs Puget Sound Health Care System. Thielen oversees the medical equipment management programs at the Seattle and American Lake VA hospitals.

Vivek K. Goyal (BSE in EE '93) completed his Ph.D. in electrical engineering at the Univer-

sity of California-Berkeley in 1998 and won Berkeley's 1998 Eli Jury Award for outstanding achievement in systems, communications, control, or signal processing. In September he joined Bell Laboratories, of Murray Hill, N.J., as a member of the technical staff. Goyal lives in Hoboken.

Margaret H. Mericle (BSE in EE '93) is a research engineer with the U.S. Navy. She worked at the David Taylor Research Center until June, when she transferred to the Philadelphia Navy Shipyard. While still at the Taylor facility, she earned a bonus for completing a three-year project on time and within budget despite large staff cuts due to the closing of a base in Annapolis.

David Mundt (BSE in BME '93) studied law after graduating from Iowa and now works for a Chicago patent firm. He lives in Buffalo Grove, Ill.

Tim Savard (BSE in EE '93) received an M.B.A. from Marquette University last December and now is a senior engineer at Baxter Health Care Corporation, of Round Lake, Ill., where he is involved in the manufacture of intravenous systems and other medical products. He lives in Gurnee.

Chun "Chuck" Zhang (PhD '93) is associate professor and graduate studies director at Florida State University's industrial engineering department. In 1999 he received the Society of Manufacturing Engineers Outstanding Young Manufacturing Engineer Award. Zhang lives in Tallahassee.

Michelle Cwick Merlo (BSE in ME '94) is a mechanical engineer at United Conveyor Corp., of Waukegan, Ill. Merlo was married last November and lives in Libertyville.

(continued on page 24)

Arnold J. Shradel (BSEE '33), of Cupertino, Calif., July 7, 1998

Elwin S. Titus (BSME '31, MS '33), of Crane, Ind., November 1977

Burton L. Allen (BSChE '34), of Walnut Creek, Calif., August 1981

Martin L. Bardill (BSCE '34), of Dubuque, Iowa, August 22, 1998

Loren D. Millard (BSME '34), of Denver, Colo.

Paul J. Pedelty (BSME '35), of Mason City, Iowa, November 13, 1998

Howard L. David (BSME '36), of Republic, Mo., October 31, 1997

Allen H. Dunton (BSE '36), of Moline, Ill., January 17, 1999

Leopold R. Michel (MS '36), of Marblehead, Mass., March 6, 1997

Everett V. Angell (BSEE '37), of Downey, Calif., December 1973

Byron D. Lind (BSME '37), of Aurora, Ohio, May 1986

Carl F. Pilger (BSEE '37), of Arlington, Va., October 28, 1998

John L. Strelow (BSCE '37), of Davenport, Iowa, November 1982

John Bogardi (MS '38), of Budapest, Hungary, November 18, 1998

Elmer C. Lundquist (MS '38), former professor of mechanical engineering, of Humble, Texas, April 27, 1999

John F. Deters (BSChE '39), of Bloomington, Minn., March 31, 1999

Vincent R. Erickson (BSCE '39), of Milford, Ohio, November 30, 1998

Samuel A. Karch (BSE '39), of Elizabeth, N.J., March 8, 1995

Ralph E. Whitson (MS '39), of Cary, N.C., October 1, 1998

Henry Z. Hardaway (BSME '40), of Lakehurst, N.J., December 23, 1998

Wayne R. Cox (BSCE '41), of Claremont, Calif., May 21, 1998

Harry L. Cuthbert (BSME '41), of Houston, Texas, June 8, 1998

Richard B. Olney (BSChE '41), of Ramona, Calif., February 22, 1997

Pao Fu Chu (MS '42)

Louis E. Davis (MS '42), of Pasadena, Calif., September 7, 1998

James F. Petrik (BSME '42), of Madeira, Ohio, August 27, 1998

Luverne R. Held (BSCE '43), August 1979

Kai Lai (MS '46), of Nan-ning, Guangxi, China, March 28, 1999

Aaron V. Donnelly (BSEE '39, MS '40, PhD '47), October 4, 1998

Ning Chien (MS '48), 1986

Yin Feng (MS '48), 1998

Ross Mullins (BSEE '48), of Albuquerque, N.M., September 9, 1998

Stanley B. Brush (BSME '49), of Scottsdale, Ariz., April 7, 1998

Joe H. Byrd (BSCE '49), of Houston, Tex., March 15, 1999

Wesley J. Gallup (BSCE '49), of Duluth, Minn., December 24, 1998

Joseph A. O'Brien (BSEE '49), of Columbia Heights, Minn., August 21, 1998

Howard E. Huckins (PhD '51), of Wilmington, Del., October 9, 1998

Francis B. Callahan (BSCE '52), of Davenport, Iowa, July 20, 1993

Roy J. Gelselman (BSCE '52), of Brookings, Ore., March 30, 1999

Lowell E. Hackbarth (BSChE '52), of Bel Air, Md., May 19, 1998

John S. Galvin (BSCE '53), of Lombard, Ill., February 27, 1999

Charles W. Oneal (BSChE '55), of Perris, Calif., January 1, 1994

John H. Hauptli (BSChE '58), of Dubuque, Iowa, July 21, 1998

Carl K. Moon (BSEE '59), of Minneapolis, Minn., November 25, 1997

John Reynolds (BSME '59), of Livonia, Mich., April 15, 1999

Roy A. Setzer (BSME '59), of Iowa City, Iowa, March 22, 1999

Merlyn J. Shoger (BSChE '59), of South Charleston, W.Va., October 17, 1998

David W. Ford (BSEE '50, MS '60), of Fort Wayne, Ind., October 14, 1998

Gordon E. Clark (BSCE '60), of Costa Mesa, Calif., March 7, 1999

Herbert W. Marske (BSCE '60), of Bettendorf, Iowa, October 22, 1998

James J. Mross (MS '60), of Morgan Hill, Calif., October 18, 1996

Ki-Shun Chu (MS '61), of Houston, Tex., November 29, 1997

William J. Roling (BSME '61), of Richfield, Minn., February 3, 1999

David P. Bureson (BSEE '67), of Solon, Iowa, January 11, 1999

Leroy Marks (MS '68), of East St. Louis, Ill., June 14, 1998

Lynn C. Jehly (MS '71), of Bayside, Wis., 1992

John H. Ketcham (BSME '76), of Marshalltown, Iowa, August 2, 1998

Daniel D. Berchenbriter (BSME '78), of Iowa City, Iowa, February 7, 1999

James R. Buck, professor of industrial engineering, June 10, 1999

Karl Kammermeyer, professor emeritus of chemical and biochemical engineering, August 6, 1999

Howard W. McCauley Jr., professor emeritus of civil and environmental engineering, July 13, 1999

CLASS NOTES

Tomasz Jakob Gawronski (MS '94) lives and works in Omaha, where he is senior structural designer for Union Pacific Railroad. Gawronski reports that he passed the professional engineer exam and that he enjoys working in his field. His goal is to design a suspension bridge or a 100-story building.

Steve Whalen (BSE in IE '94) is a senior industrial engineer at Rochwell International, in the enterprise productivity group.

Sergio Almanzar (BSE in IE '95) lives and works in Miami, Fla., where he is a project engineer at B/E Aerospace-Aircraft Modular Products.

Lee Hai Leong (BSE in EE '95) is a field application engineer at Texas Instruments' Silicon Systems, in Singapore. The company provides technical application support to multinational concerns.

Marc Roehl (BSE in CE '94, MS '95) changed jobs last year and now works at MSA, a Baraboo, Wis., environmental engineering firm.

David Adamson (BSE in CE '94, MS '96) won an environmental chemistry award from the National American Chemical Society.

Brad Helland (MS '96) is environmental programs administrator and environmental engineer for the Naval Undersea Warfare Center, Raytheon Range Systems Engineering Atlantic Undersea Test and Evaluation Center.

Gopal Kasichainula (MS '96) is the project manager for information systems, worldwide implementation of process planning, and cost estimations systems for Case Corporation, of Bettendorf, Iowa.

Riwanto Megosinarso (MS '96) is working for Andersen Consulting in Indonesia, as an analyst in process competency.

Dong Banh (BSE in ME '97) is a technology consultant at PriceWaterhouseCoopers. Over the past two years he has helped his mother set up an oriental gifts and travel busi-

ness, gotten involved in domain name reselling, and worked with partners to develop a web business.

Tim Bechen (BSE in EE '97) is studying intellectual property law at Franklin Pierce Law Center and expects to graduate next spring. Last summer he was an intern at an intellectual property law firm in Atlanta. He also is working part-time on web page design and consulting projects.

George Constantinescu (PhD '97) is a faculty research associate in mechanical and aerospace engineering at Arizona State University.

Garth Dolphin (BSE in ME '94, MS '97) is an engineer at Electric Boat Corp., of Groton, Conn., where he performs computational fluid dynamic analysis to evaluate the hydrodynamic performance of submarines. Dolphin adds that Electric Boat is part of General Dynamics, the nation's leading builder of nuclear-powered submarines for the U.S. Navy. Dolphin and his wife, Laura, live in Gales Ferry and enjoy waterskiing and kayaking.

Donald M. Hemphill (BSE in CE '97) joined Randolph & Associates, Inc., of Peoria, Ill., in April as a civil engineer in the water/wastewater group. Hemphill reports that he works on a wide variety of civil projects in the Peoria area and surrounding communities. He lives in Glasford.

Jeff McCollum (BSE '92, MS '94, PhD '97) is a research scientist at the satellite branch of the National Oceanic and Atmospheric Administration, in Camp Springs, Md. He lives in Alexandria, Va.

Jeffrey Reynolds (MS '97) is a product engineer at the John Deere Davenport Works, where he works on the design and implementation of power-train systems. He lives in Dubuque.

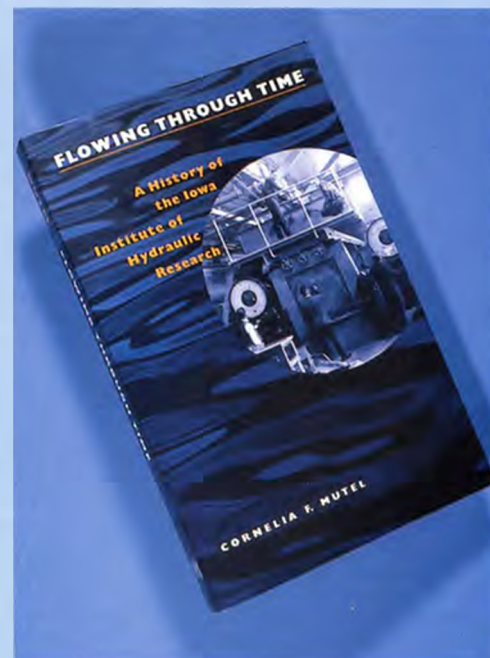
Alyson A. Rokaitis (BSE in ChE '97) is a process engineer at Fluor Daniel, a Cincinnati engineering and construction firm. Rokaitis lives in Maineville, Ohio.

Cheng-Ann Tan (MS '97) has moved to Singapore.

Stephen Wilkinson-Gruber (BSE in EE '97) is an engineer in server group development at IBM in Rochester, Minn., designing mixed-signal integrated circuits for fiber-optic data communication modules. Gruber recently was married.

Steven Zellers (MS '97) is one of three founding partners of Verdical, L.L.C., a full-service urban simulation company that helps architects and developers model their projects. The company, which uses computer graphics and simulation technology to create real-time simulated walk-throughs of planned construction and other projects, has been approved as a new affiliate at the Iowa Technology Innovation Center on the University's Oakdale Campus.

Tony Mirchandani (BSE in EE '98) is one of 37 Iowans appointed to Governor Tom Vilsack's blue-ribbon planning council, Iowa 2010, whose charge is to set a course for making Iowa more attractive and competitive, and for keeping more young Iowans in the state. The Chicago native, who earned one of the college's first certificates in technological entrepreneurship, works at Hon Industries, of Muscatine, where he is a business analyst for the company's business ventures department.



Book tells scientists' role in shaping premier institute

They've designed, modeled, and done research on army kitchen grease traps, highway culverts, firefighting nozzles, flush toilet hydrology, ice removal, flood control, river locks and dams, hydropower plants, and much, much more. They've also compiled a vast body of basic research, gained international renown, and taught and mentored countless engineering students. "They" are the engineers who have worked at the Iowa Institute of Hydraulic Research over the facility's almost-80 years. Their feats—and their lives—are told in a new book, *Flowing Through Time*.

Written by IIHR staff historian Cornelia F. Mutel, *Flowing Through Time* reveals the institute through its researchers and educators. It begins with the story of IIHR's first director, Floyd Nagler, who in 13 years increased the facility's size 50-fold and its staff from 4 to 26 before dying young from a ruptured appendix. The book goes on to tell how the institute expanded, diversified, and prospered, and how its activities fit within a larger context—for instance, how World War II and the environmental concerns of the 1970s influenced its work.

To read more about the Iowa Institute of Hydraulic Research and its engineers, contact the institute or check out the book's web site: <<http://www.iihr.uiowa.edu/>>

UI College of Engineering

Alumni Academy inductees '99

Iowa's Distinguished Engineering Alumni Academy

capped National Engineer's Week 1999

by inducting five College of Engineering alumni into its ranks.

The inductees were honored for their
personal engineering achievement, leadership,
and service to the profession and society.

James C.I. Dooge

MS in mechanics and
hydraulics '56

Dooge is a consultant hydrologist at University College of Galway and professor emeritus at the Center for Water Resources Research, University College of Dublin (Ireland).

Dooge, a founding father of computer-based statistical hydrology, also has had a long and varied career in politics. During his 1961-77 service as an Irish senator, he helped rewrite the Irish constitution. He was Ireland's minister of foreign affairs from 1981 to 1983 and its senate majority leader from 1983 to 1987.

In 1986 he received the Bowie Medal from the American Geophysical Union. He holds honorary doctoral degrees from the Universities of Waeningen (Holland), Lund (Sweden), and Birmingham (England), as well as from the University of Dublin.

L.D. McMullen

BSCE '68, MS '72 and PhD '75, both in environmental engineering

McMullen is CEO and general manager of the Des Moines [Iowa] Water Works. During the mid-western floods of 1993, McMullen and his staff received nationwide attention for their engineering accomplishments in restoring drinking water to Des Moines. McMullen has received the Iowa Engineering Society's Outstanding Public Service Award, Engineer of the Year Award, and Voice of the Engineer Award.

McMullen remains active with his alma mater, having served a four-year term as chair of the College of Engineering Advisory Board. He sits on the UI Alumni Association executive board and is president of the organization's board of directors.

William B. Morgan

MS in mechanics and
hydraulics '51

Morgan heads the Hydromechanics Directorate, Carderock Division (David Taylor Model Basin), at the Naval Surface Warfare Center, in Washington, D.C.

Morgan, who earned a doctorate in naval architecture from the University of California, has devoted his career to work at the center. Since 1979 he has had responsibility for all hydromechanics research concerning U.S. Navy ships and submarines. He also led the development of the large cavitation water tunnel in Memphis, Tenn., a facility that has furthered advances in ship design.

A member of the National Academy of Engineering, Morgan holds the Gibbs Borthers Medal, presented by the National Academy of Science.

Jin Wu

MS '61 and PhD '64, both in
mechanics and hydraulics

Wu is president of National Cheng Kung University (Taiwan). Wu has served as education minister for Taiwan, and from 1980 to 1994 he was the H. Fletcher Brown Professor of Marine Studies and Civil Engineering at the University of Delaware from 1980 until 1994.

He is a member of the National Academy of Engineering.

Chen-Hsing Yen

MS '38 and PhD '41, both in
mechanics and hydraulics

Yen is senior adviser to the president of Taiwan.

After completing his education at Iowa, Yen returned to China to teach and to lead construction work on the Burma Road. After moving with his government to Taiwan in 1949, he was appointed chief engineer of the Kaoshiung Harbor Bureau. Later, he again turned his sights to education and has served as president of National Chen King University, National Tsing Hua University, and National Taiwan University. During his 24-year tenure as Taiwan's minister of education, he extended compulsory education to nine years and established professional junior colleges.

He is a member of the Academia Sinica.

COLLEGE NEWS

The Center for Global and Regional Environmental Research is one of four Iowa organizations to receive 1998 energy Leadership Awards from the Iowa Department of Natural Resources. The DNR described the center as "one of the few academic research centers in the country to successfully use its research to implement actual programs in industry and government." The center is co-directed by engineering professors Jerald Schnoor and Greg Carmichael.

Biomedical Engineering

K.B. Chandran, professor, was elected in December to the editorial board of *Auytomedica*, an international journal of biomedical engineering and physics, informatics, and technology. In April the American Society for Engineering Education presented Chandran with the Theo C. Pilkington Outstanding Educator Award for contributions to the society and the profession.

Chandran also has been named head of the biomedical engineering department (see story on page 10).

Chemical and Biochemical Engineering

Greg Carmichael, professor, in January received the first Recognition Award given by the 6th International Conference on Atmospheric Sciences and Applications to Air Quality, held in Beijing, China. The award recognizes "continuous and exceptional contributions to the application of scientific knowledge for the goal of improving air quality worldwide."

Robert J. Linhardt, professor, has been named the 1999 recipient of the American Association of Colleges of Pharmacy's Volwiler Research Achievement Award. Linhardt was presented with the award at the association's July centennial meeting in Boston.

Civil and Environmental Engineering

Jerald L. Schnoor, professor, has been elected to membership in the National Academy of Engineering (see story this

page). In September Schnoor received the American Society of Civil Engineers' Rudolph Hering Award for the most outstanding contribution to environmental engineering in 1998.

Wayne Paulson, professor, has received the Outstanding Civil Engineer Award from the Iowa section of the American Society of Civil Engineers.

Gene F. Parkin, professor, has won the State Board of Regents Award for Faculty Excellence.

Wilfrid Nixon, professor, in September was elected associate director of the American Society of Civil Engineers board of directors, Iowa section.

Jasbir Arora, professor, received the State-of-the-Art of Civil Engineering Award from the American Society of Civil Engineers last August at the annual meeting of the society's structures congress.

Keri C. Hornbuckle, assistant professor, was chosen last August to receive a National Science Foundation Career Award for her study of the dynamics of gas-phase persistent organic chemicals.

Electrical and Computer Engineering

Irith Pomeranz, professor, has been elected a fellow of the Institute of Electrical and Electronics Engineers. The institute cited Pomeranz's contributions to test generation for digital logic circuits.

Mechanical Engineering

Ching-Long Lin, assistant professor, has been chosen to receive a National Science Foundation Career Award.

Sharif Rahman, assistant professor, has been chosen to receive a National Science Foundation Career Award. Rahman is co-winner of the Outstanding New Mechanics Educator Award, presented by the mechanics division of the American Society for Engineering Education. He also won a UI Hancher-Finkbine Medalion in April (see story on page 10).



Innovation and dedication win top honors for prof

A University of Iowa professor has received the highest honor the engineering profession bestows—election to the National Academy of Engineering. Jerald L. Schnoor, who is the F. Wendell Miller Distinguished Professor of Civil and Environmental Engineering and co-director of the University's Center for Global and Regional Environmental Research, was formally inducted into the academy on October 3 in Washington, D.C.

Schnoor was recognized for his research and engineering leadership in developing, validating, and using mathematical models for global environmental decision making.

A professional engineer and UI faculty member since 1977, Schnoor has researched and written on a wide range of environmental problems, including toxic chemical fate and transport, water quality modeling, and the biogeochemistry of global change. Together with several students,

he has pioneered the use of phytoremediation for cleaning hazardous waste sites (see *Iowa Engineer*, fall/winter 1997).

Among Schnoor's many honors was his 1998 appointment as the Association of Environmental Engineering Professors Distinguished Lecturer.

The National Academy of Engineering has 1,984 members, 13 of whom are UI engineering alumni. Schnoor is the college's only faculty member who currently belongs to the academy. The late professors John F. Kennedy, Louis Landweber, and Hunter Rouse were members.

Commenting on the award, UI President Mary Sue Coleman said, "We are delighted that Jerry Schnoor's election to the National Academy of Engineering recognizes his leadership in environmental research and engineering education. The honor is richly deserved, and it enhances the national reputation of the College of Engineering and The University of Iowa."

College loses three who were mentors, colleagues, friends

The College of Engineering lost three longtime professors this summer. James R. Buck died June 10, Karl Kammermeyer died August 6, and Howard W. McCauley died July 13.

Buck, professor of industrial engineering, came to the University in 1981 to head the Department of Industrial Engineering. In 1988 he stepped down as head and continued as a professor. His specialties were ergonomic engineering and engineering economics. Before coming to Iowa he served with the U.S. Navy Corps of Engineers, earned his doctorate at Michigan Technological University, then taught at Purdue University. He belonged to the American Institute of Industrial Engineers and the Human Factors Society and won two Eugene Grant Awards. Buck was 69.

Kammermeyer, professor emeritus of chemical and biochemical engineering, earned his doctoral degree from the University of Michigan and worked at Standard Oil and Pure Oil, the Drexel Institute, Publicker Industries, and the Glen L. Martin Company before joining the University in 1949 as head of chemical engineering. He chaired that department until his retirement in 1972. He was 95. In 1992 the Karl Kammermeyer Education Fund was established in his honor at The University of Iowa Foundation.

McCauley, professor emeritus of civil and environmental engineering, joined the engineering faculty in 1956, became a full professor in 1963, and retired in 1990. He earned a master's degree from the University of Minnesota and worked for Northern Pacific Railroad, the U.S. Army Corps of Engineers, and Red River Engineers, and taught at North Dakota Agricultural College before coming to Iowa. He was a fellow of the American Society of Civil Engineers and an initiate of Phi Beta Kappa, Tau Beta Pi, and Chi Epsilon honor societies. McCauley was 79.

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